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August 1931

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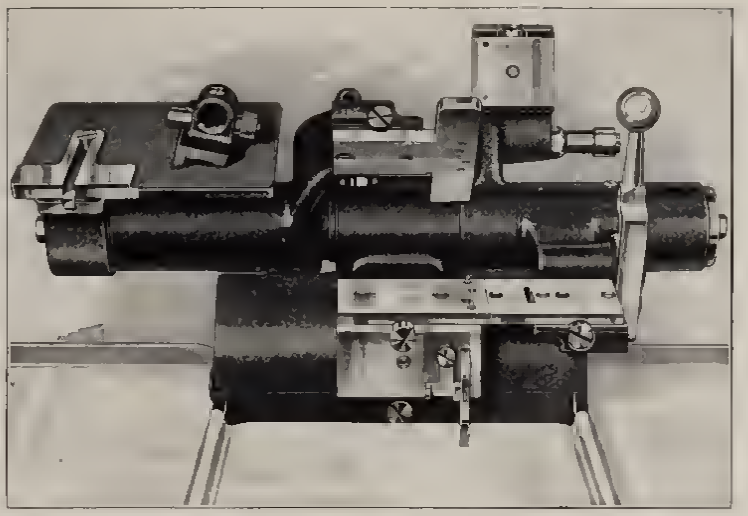

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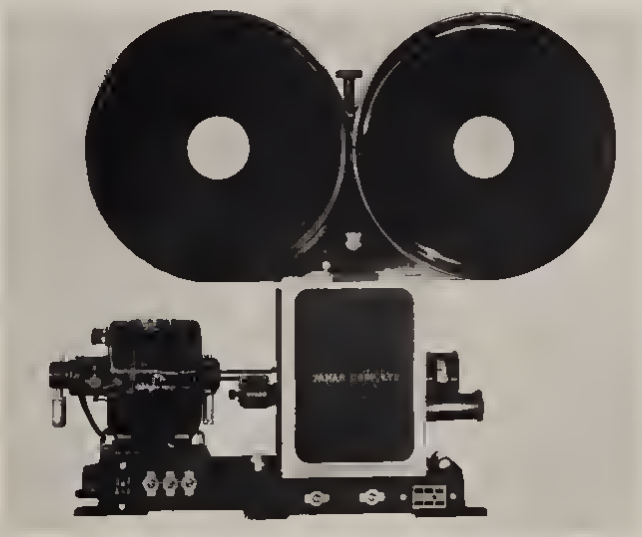

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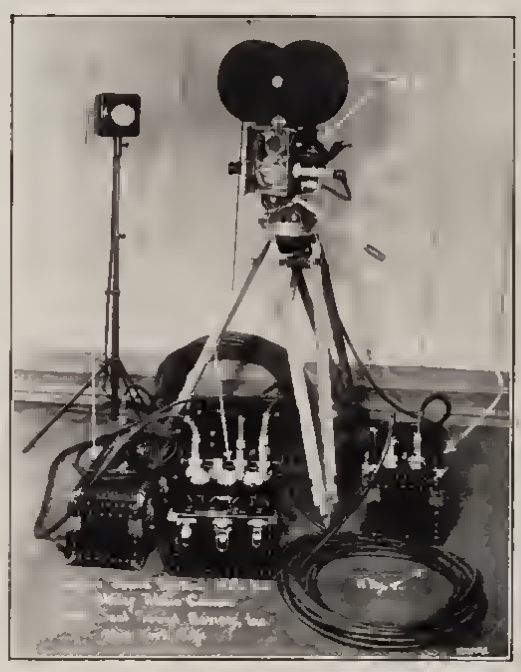

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Top, L. to R.—Elephants as camera-platforms. Doug meets Aguinaldo. Doug bags his first leopard.

Second row—Henry and some Hindu friends. The Royal Siamese Ballet performs for us. Henry, Doug and Vic on the Agra Golf-links.

Center, left—Vic and Henry at the Taj Mahal. Right—Doug visits Angkor Vat on elephant-back. Middle above: Vic and some Chinese beauties. Doug and Mei Lan Fang's family. Below: Vic, Duke Kahanamoku, Dick Arlen, and Doug are welcomed to Honolulu. Doug and some young Siamese admirers.

Fourth row: Doug poses for the amateur photographers. Doug and Vic discuss pictures with a Chinese cinematographer. Lunch-time on the Tiger-shoot.

Bottom: R. and L., The Ghats along the sacred Ganges at Benares, center: Henry and an aged Chinese beggar.

Four Musketeers . . and a Camera

by **HENRY SHARP, A. S. C.**

HELLO, HENRY—this is Doug Fairbanks. I'm going around the world, want to come along, and bring your camera with you?" This surprising statement greeted me when I answered the strident ringing of my telephone one morning last winter. While I struggled to recover from my surprise, Doug's voice kept on tempting me with glowing phrases about the glamour of the East—of Royal elephant hunts in Siam—of tiger-shoots in India.

Business, family ties, and everything conspired to hold me here in Hollywood; but there was no denying Doug. He was determined that I should come with him, so come I must. Every obstacle that I or chance threw in his way, his tremendous enthusiasm abolished, so finally when he boarded the S S "Belgenland" to start the first lap of his trip, I was with him—and quite as enthusiastic as he.

Four months and one week later I returned to Hollywood, after one of the most strenuous and delightful experiences of my life. The close companionship of such a voyage has a way of revealing the true character of a companion as nothing else will, travelling with some people is an ordeal—but travelling with Doug proved to be a joyous adventure. No matter what were our surroundings—whether they were the palaces of the various kings and rajahs that entertained us, or the sultry discomforts of a jungle hunting-camp—Doug was always the same, cheerful companion, enjoying himself so hugely that the rest of us could not help enjoying ourselves, too.

Our party consisted of Doug himself, Victor Fleming, "Chuck" Lewis (Doug's trainer and pal), and myself. Here and there we met kindred spirits who would join the party for a few days or weeks, but our party proper consisted of this quartette—the Four Musketeers, as Doug called us, looking for new worlds to conquer, and finding new adventures everywhere. Our route took us across the Pacific to Japan, then to China and the Philippines, then to Cambodia and Siam, where we were literally Royally entertained, being the guests of H. M. King Prajadhipok, across to India, where we were again Royally entertained both by the many native princes and (in a quite different way), by My Lord, the Tiger. From India we reluctantly turned our steps to Europe, where, in Paris, we separated, Vic and I to return to Hollywood and the prosaic realities of picture-making in Hollywood, and Doug and Chuck to Scotland and—golf.

We had many wonderful experiences to look back on, but our reminiscences were by no means all in memory, for we brought back with us more than 30,000 feet of film which we had taken on the way. This film was photographed primarily for our own pleasure, but since our return it has proven so interesting, not only to ourselves, but to the various friends and associates whom Doug has invited to see the "rushes" as the shipments straggled in, that it may possibly be generally released.

Our photographic equipment consisted of my Studio camera, which was fitted with a Tanar portable recording system, and two Eyemos. The Eyemos were a revelation to me, for I had had little confidence in the performance of such hand-cameras, to my surprise, they not only performed perfectly, and gave exceptionally fine photographic results, but they proved themselves quite indispensable for this sort of work. There are hundreds of the most interesting scenes which we could never have made, had we not had these dependable, unobtrusive little instruments. We were likewise fortunate in the photographic talent we had available, for Vic Fleming, before he started directing, was an outstanding cinematographer himself. So both of the Eyemos were kept busy. Another surprise was the skill that I acquired in the course of our journey as a sound engineer. Before leaving Hollywood I had had no more experience at actual sound recording than any other cameraman might naturally acquire in the course of photographing talking pictures. I knew, of course, the rudiments of recording practice, but as I had always been busy enough to make me glad to leave the details of recording strictly to the sound engineers on the set, it was with some trepidation that I undertook the recording of the various scenes which we made in sound. I shouldn't have recognized a decibel or a piece of sound perspective if it had come up

Henry Sharp, A. S. C.

and bitten me! But the experience I had on the trip as sound-man-and-cinematographer has made me feel quite like a recording expert. I shouldn't flatter myself, though, for without doubt most of the credit for the good recordings we made should really go to the simplicity of the Tanar recorder we used. I doubt if I could have made a mistake with it, if I had wanted to. That outfit gave me one lasting regret, though, for all the way across the Pacific I spent most of my time studying the instructions and blueprints that Len Roos gave me, and by the time that we were ready to shoot, I felt myself quite an expert sound "trouble-shooter"—but the darned thing obstinately refused to give me any trouble to shoot!

Aside from my inexperience as a recordist, the only technical worry I had on my mind was the effects that the tropical climates we passed through and worked in might have on the film. I had never worked in the tropics before, and the heart-rending tales that my friends who had done so primed me with had by no means tended to cheer me up. I took every possible precaution, however, never leaving the film in the magazines any longer than was absolutely necessary, and then immediately sealing it up in the cans, with plenty of the good, old calcium chloride to absorb the moisture. As a result, we did not lose a foot of film from this trouble, although we shot thousands of feet in the Philippines, Siam, Cambodia, and India. The laboratory work was all done in Hollywood, which is a plan that I can heartily recommend to all my fellow-travellers, for, with rare exceptions, both the cine and still labora-

(Continued on Page 211)

The Mercury Arc as a Source of Intermittent Light

by **HAROLD E. EDGERTON**
Massachusetts Institute of Technology

MOTION pictures are ordinarily taken by means of a mechanical mechanism that stops the film intermittently on each frame and then opens a shutter. The shutter can be eliminated if the light is intermittent and in phase with the film so that the light is on only when the film is stopped. With a light of very short duration but of high intensity it is possible to run the film at continuous speed, the limitation being that the film must not move an appreciable distance while the light is on. Framing by this method is accomplished by flashing the light at time intervals determined by the speed of the film so that the pictures do not overlap and are not spaced too far apart.

Another application of intermittent light for motion pictures is the possibility of taking slow-motion pictures of rapidly moving machines or mechanisms. This is conveniently done by arranging the frequency of the light so that it differs slightly from the frequency of the mechanism. For each exposure the mechanism will have gone through its entire sequence of events plus an increment. The apparent motion of the projected mechanism is then at a frequency which is the difference between the light and mechanism frequencies.

Practical difficulties and physical limitations in the past have imposed restrictions on the production of flashing intermittent light by ordinary methods. Neither the incandescent nor the carbon arc can be induced to give intense light flashes of short duration since their illumination depends upon the temperature of a filament or an arc. Both of these lamps can only change their illumination qualities slowly because of the heat capacity of the incandescent parts. The efficiency of an alternative arrangement using a shutter or a rotating disk with slots is poor since the light needs to be operated at full brilliancy all the time. There are also mechanical limitations upon the speed of the shutter or the disk due to vibration and stresses.

Light sources that obtain their illumination qualities from electrical discharges in gases, such as neon or mercury, have practically no time lag when turned on or off. The neon tube, because of this property, has been used for television and for stroboscopic observations. However, the light from the neon discharge is mainly red and is not very effective for photographic uses. Intense sparks in air have been used successfully for rapid photography but the auxiliary apparatus is generally bulky because of the necessary high voltage and, moreover, the control of the discharges is difficult.

The familiar mercury-arc lamp, slightly modified, can quite readily become an intense source of intermittent light if connected to the proper electrical circuits. The light from the mercury-arc consists mainly of strong violet and blue colors which are very actinic.* One of the remarkable properties of this type of light is that it can be made to give a flash in less than ten microseconds. Another is that the instantaneous intensity is a great many times that of the normal rating of the tube so that the average light compares with that of continuous operation. A fourth property is that the time between the flashes is easily controlled by means of a grid. These characteristics give the mercury-arc thyratron some interesting possibilities as a practical intermittent light source. "Thyratron" is the name that has been given by the General Electric Co. to gas-filled arc discharge tubes that have control grids.

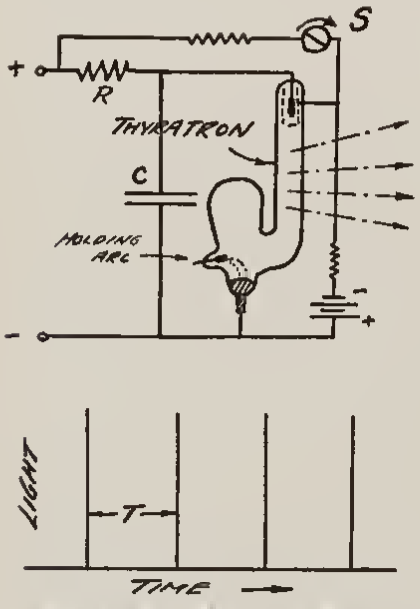


Fig. 1. Electrical circuit which affords a source of intense intermittent light of high actinic value. The lower figure shows how the light intensity varies with the time.

The elements of an intermittent mercury-arc thyratron light source are sketched in Fig. 1 together with a plot of the variation of light against time. The condenser, C, builds up a charge through the resistance, R, from a d-c supply while the grid is negative with respect to the cathode. At the moment the switching arrangement, S, makes the grid positive the anode begins to conduct and the tube practically acts as a short circuit to the condenser. The time for this discharge is determined by the characteristics of the thyratron and also by the resistance and inductance of the wires that connect the condenser to the tube. From a practical standpoint the time for the discharge is negligible for most purposes. When the switch, S, opens, the grid gains control and the condenser accumulates a charge for the next flash. The time between flashes, marked T on Fig. 1, is determined entirely by the speed or frequency of the switching or tripping arrangement and is adjustable over rather wide limits. The switching arrangement may be either a mechanical make-and-break or a source of alternating voltage such as a vacuum tube oscillator.

* A spectroscopic study of the time distribution of the radiation by means of Professor D. C. Stockbarger's synchronously rotating drum spectrograph (described in the Review of Scientific Instruments, April, 1930) shows that the majority of the actinic light is between 3660 and 4348 Å for the flash.

Stroboscopic Motion Pictures of Synchronous Machines

The particular problem to which the use of flashing intermittent light has been successfully applied is the stroboscopic photography of the angular displacement of a synchronous motor Motion pictures of the rotor were taken while a motor pulled into synchronism after having been started as an induction motor

The rotor of a running synchronous motor, when observed with intermittent light of the same frequency as the alternating current which drives the motor, appears to be stationary, since the poles are in exactly the same position when the flash of light occurs However, when the load on a synchronous motor is changed the poles must drop back in phase to supply the required torque and this angular shift is observed when the rotor is illuminated by means of stroboscopic light The rotor usually oscillates about its final steady operating angular position eventually stopping there

Observations of such motional transients of synchronous machines have been made by means of neon stroboscopes but accurate readings of the position of the rotor cannot be made

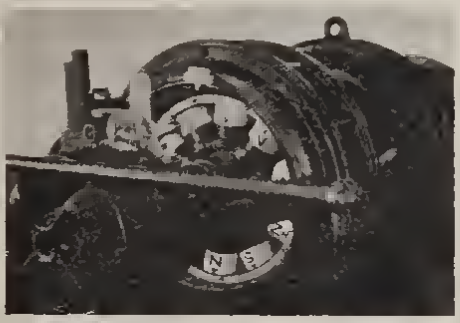


Fig 2 Photograph of a large synchronous motor arranged with a thyratron source of intense stroboscopic light for taking motion pictures of the angular transients of the rotor

when the rotor is rapidly changing its position The intense intermittent light of the mercury-arc thyratron tube that has been described has made it possible to take such readings by means of motion pictures

Fig 2 shows a synchronous motor together with a thyratron tube so that stroboscopic motion pictures can be taken The poles are surrounded with white cardboard in order to be photographed more easily This motor rotates at 720 rpm and its rotor is about four feet in diameter, so that the periphery is traveling at a speed of about 9000 feet per minute or approximately 100 miles per hour The camera is placed about three feet from and perpendicular to the rotating periphery For a satisfactory photograph the rotor must not move more than 0.02 inch for the exposure Knowing the velocity of the rotor, it is possible to calculate the necessary duration of the light thus

$$0.02 \div \frac{9000 \times 12}{60} = 11 \times 10^{-6} \text{ seconds}$$

or about 10 microseconds If the film is to be properly exposed in this short time the mercury-arc tube must produce a powerful light As a very approximate calculation consider that a 50-watt incandescent lamp would give an equivalent exposure if placed in the same position while operating continuously The stroboscopic illumination necessary in ten

Fig 3 Four enlarged 16 mm motion picture frames taken while the motor was running A change in the phase of the pole is noticeable between frames

microseconds to give the same average light is that of an 83,000-watt lamp For this calculation the frequency of the light flashes has been taken to be sixty times per second

The switching arrangement for these stroboscopic tests was a transformer connected to the stator The secondary voltage of the transformer was made sufficiently high so that the discharges were regularly timed

The ideal way to take motion pictures by means of intermittent light is to synchronize the light and the camera so that the flash of light occurs when the shutter is open Such an arrangement requires for this problem a camera driven by a synchronous motor at 60 frames per second However, it is possible to take satisfactory pictures at 16 frames per second and depend upon the random coincidence of an open shutter and a light flash to occur at the same time Actually the shutter for this case is open about 0.033 second and during this time the light will flash once or possibly twice Since the angular period of the synchronous motor is slow, about one cycle per second, a double exposure on one frame shows the pole in practically the same position for both The double exposure does not result in enough difference in density to cause any appreciable effect upon the projected pictures

Four enlarged 16 mm frames are shown in Fig 3 They were taken on panchromatic film with an Eastman Cine Kodak having a lens speed of f/1.9 The synchronous motor was rotating 720 revolutions per second when these were taken and the change in phase of the rotor between successive frames is clearly shown From the sharpness of the pictures, the exposure must have been less than about ten microseconds These movies were taken from a 100-foot reel that recorded the pulling-into-step transients of a synchronous motor just as it reached synchronous speed following the starting period They were used to illustrate a paper upon the pulling-into-step problem that was presented to the American Institute of Electrical Engineers at New York in January, 1931

Printed Through the Courtesy of the S. M. P. E. Journal

Quadzazet Fort in Morocco This is the extreme inland outpost of the Foreign Legion

Native dance being staged at Pasha's Palace, Quadzazet, Morocco for the entertainment of the American picture men.

A Romantic Journey

In Which an A. S. C. Member Visits Three Continents

by **HAL HALL**

IF YOU or I should drop in on a perfect stranger and he should kick his wife out of her private boudoir so we could have it as our resting place, we would think him a hospitable fellow. But—what would you think if the man ousted a whole flock of wives and turned their quarters over to you?

That is just what happened in the Pasha's Palace at Quadzazet, Morocco, when Harry Perry, widely known Hollywood Cinematographer and member of the American Society of Cinematographers, pulled up at said abode in company with Curtis Nagel, Howard Brown and Claude Flemming after a long, hot journey over burning desert sands. The Pasha only had four wives in his harem, but he quickly ousted them and installed the four American strangers therein to sleep upon their downy beds amid the delicate perfumes and incense drenched quarters that are usually "tabu" to all but the head man of the family in a country where said head man's limit of wives is governed solely by his purse and his desires.

As a further gesture of hospitality the very friendly and hospitable Pasha then called close to three score of his beautiful dancing girls and staged a special dance for the entertainment of his guests, which lasted for seven consecutive hours.

"And what a peculiar dance it was," says Mr. Perry. "During the entire seven hours I don't think that any of the dancers moved over a space of more than two feet. They all lined up in a big circle, with the musicians in the center. Then they started the dance which consisted principally of shifting their weight from one foot to the other in time with the monotonous thumping of the crude drums of the musicians. Those girls just picked them up and laid them down enough times to have covered miles if they had been walking. With their training, they ought to make marvelous marathon runners.

"But, as for hospitality, you will never find so much as in that country of desert sand and sunshine and fighting natives. Their homes are yours and you cannot stay too long to suit them. One might have thought the girls had danced enough when they finished the night program, but they lined right up again in the morning and staged the dance again so we could photograph it. And it was a colorful picture. I photographed it in natural colors (Multicolor) and it proved to be a gem among the many unusual scenes which we secured on our journey."

Mr. Perry's trip was made for the purpose of photographing four of the series of "Romantic Journeys" which Nagel and Brown are producing for Educational release. Because of the nature of the pictures, only the unusual and out-of-the-way places of the world are pictured, which takes the cameramen into the most delightful spots.

"We spent three months on this trip," said Mr. Perry, "and it was one of the most interesting journeys I have ever made. We landed in Northern Africa where, through the auspices of the French government, every courtesy was extended us. The episode at the Pasha's Palace in which he threw open his harem for us, was typical of our reception throughout the entire country."

(Continued on Page 28)

Left to right: Arab policeman; Curtis F. Nagel, chief of police at Manchesh; Claude Flemming and Harry Perry, photographed at Manekesh, Morocco.

Jack Holt in a scene from "Dirigible," photographed in the famous airship, "Los Angeles"

A view down the "Catwalk" of the "Los Angeles"

Putting the Realism into "Dirigible"

by **JOSEPH WALKER, A. S. C.**

IN A recent review of the picture "Dirigible," which I photographed, the critic commented that the picture was a shinning example of what could be done by the judicious use of stock scenes While I am, naturally, grateful to the gentleman for the other very nice things which he wrote about the production, I feel that he has been most unjust in making the above-quoted statement, for "Dirigible" was **not** made of stock scenes With the exception of two scenes (one of the Lakehurst, N J, railroad station, which had been removed some months before the film was made, and one of a sealing ship in the Antarctic), every scene in the picture was exactly what it represented itself to be And when a relatively smaller firm, such as the producer of "Dirigible," deliberately assumes the very considerable cost of assuring absolute authenticity in a production where the cheaper stock scenes could "get by," I feel that it is only fair that we of the Industry should give them all possible credit for so doing

Many of the scenes of this picture centered around the U S Naval Air Service and particularly around the operation of Naval Dirigibles There is no dearth of stock film of these operations, and had such scenes been used, I am sure that, between intricate cutting, process work, and miniatures, adequate results could have been attained, at a relatively small cost But Columbia was not out for merely adequate results in "Dirigible," and Samuel Briskin, the studio's general manager, who personally supervised the making of the picture, and who is perhaps more keenly exacting in the matter of getting a full dollar's worth of production for every dollar spent than any other executive in the business, was wise enough to see that an otherwise superlative production would fall very flat if such important scenes were made "merely adequate" Therefore he spared no expense in assuring absolute authenticity in every detail of the production

Hence, as the readers of this magazine will recall from Elmer G Dyer's recent article on the making of "Dirigible," Mr Briskin transplanted the entire production unit from Hollywood to Lakehurst and, accompanying the unit himself, saw to it that neither the Director, Frank Capra, nor I as cinematographer, were so unduly rushed as to slight any of these important technical and artistic details of the production It is all too seldom that we get such cooperation from the producer now-days, when the cry is "save here—skimp there—anything to cut costs" So it is no wonder that Mr Capra and I—and the whole troupe, in fact—were filled with enthusiasm, and strove our hardest to turn out a really great picture

We spent many weeks at Lakehurst, comparatively unhurried, seeking only to get the utmost of accuracy and cinematic effectiveness into our scenes When we left, I believe that we all felt that we had succeeded And all during this time, Mr Briskin, apparently unmindful of the fact that our company overhead was mounting at the rate of more than $15,000 per day, had insisted, not on rushing through any way, but on getting the best and most accurate scenes possible

My chief concern at Lakehurst was the photography of the various scenes on the ground, and in the great dirigible "Los Angeles" itself, as Mr Dyer was in charge of the scenes taken in the air of the big blimp The ground work, though exacting, was comparatively easy, although working with a large number of cinematographers—Eastern men, with whose individual characteristics and capabilities I was not as perfectly accustomed as I would be with a Hollywood crew—was at times a bit trying But the work in and from the big blimp was interesting and exacting in the utmost One sequence in particular I recall it required scenes of a Naval airplane attaching itself to a trapeze beneath the "Los Angeles" Mr Dyer covered the action from a smaller blimp flying alongside, while I and my associates photographed it from the big ship itself. I placed one man with an Akeley in one of the motor-gondolas, an Eyemo on the airplane itself, and then stationed myself to catch close-ups of the contact from just above the trapeze-opening I had intended naturally, to use a big studio camera, but when the time came I found that there was no place for so large a camera—so instead I used an Eyemo I had little enough faith in the small camera, but as I had to cling, spread-eagled among the aluminum frame-girders of the ship's hull, hanging on by one toe and my eyebrows, with nothing but about 6,000 feet of thin air between me and terra firma, I had to be content with the hand-camera, and hope for the best And, to my surprise, I got the best! In other words, I got one of the most spectacular shots of the picture—a fine close-up of the plane approaching, and making the contact. Incidentally, this bit took flying skill of the highest order, for the plane had to approach the trapeze by a circuitous route, around the stern engine-gondola, and then up to the hook, and (due to the difference in the speeds of 'plane and Zepp), at almost its minimum flying speed, where control was a very difficult matter And yet that obliging pilot cheerfully did this stunt many times, while we made take after take of the scene

The scenes which we photographed within the big blimp were most interesting photographically. A Zeppelin, as you may know, is constructed of spidery aluminum girders, covered with doped linen, and containing a large number of smaller gas-bags, or balloonets, of silk, lined with gold-beater's skin For the most part, the outer covering is doped with an opaque aluminum or silvered pigment, which keeps the light and heat of the sun from the gas-bags, but the lower part of the ship is covered with translucent linen, which is merely plain, white linen tightened to a drum-head tautness with unpigmented dope This admits a beautifully diffused, soft light, which comes naturally, entirely from below. Here and there observation holes are cut in this lower covering, making a very peculiar lighting combination, of this soft, diffused under-lighting, with here and there "hot spots" directly above the holes Although this picture was made before the introduction of 'Fast Film," there was ample light for good photography, and the results on the screen were beautiful in the extreme Both Mr Capra and Mr Briskin commented upon this point, and when, upon our return to Hollywood, it became necessary to make additional scenes to match up with these taken in the blimp in the air, they were most insistent that I depart from the ordinary studio lightings, and match the original lightings to perfection That **was** a problem! I experimented with all sorts of silks and jellies on my lights, and finally decided that I must pass my light through unpigmented, doped linen exactly as the light was passed through it in the actual Zepp This proved difficult to do in the studio, for we built up an exact reproduction (metal girders and all) of a hundred-foot section of the interior and framework of the "Los Angeles" You may think a studio stage is a big place, but you've no idea how it shrinks when you try to stuff a piece—even a small piece—of a huge dirigible into it Our biggest stage was crowded to the limit to accommodate our set From my viewpoint, it would have been quite all right had there been enough room to suspend the structure ten or fifteen feet above the floor, so that I could get my lights beneath it but the struc-

(Continued on Page 20)

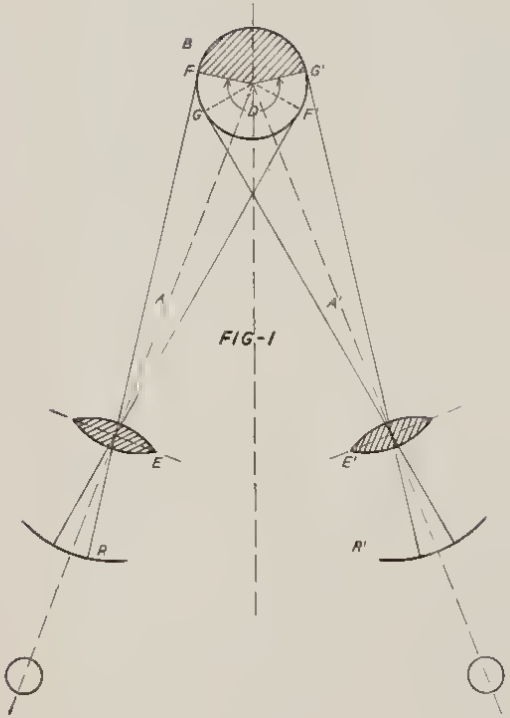


FIG-1

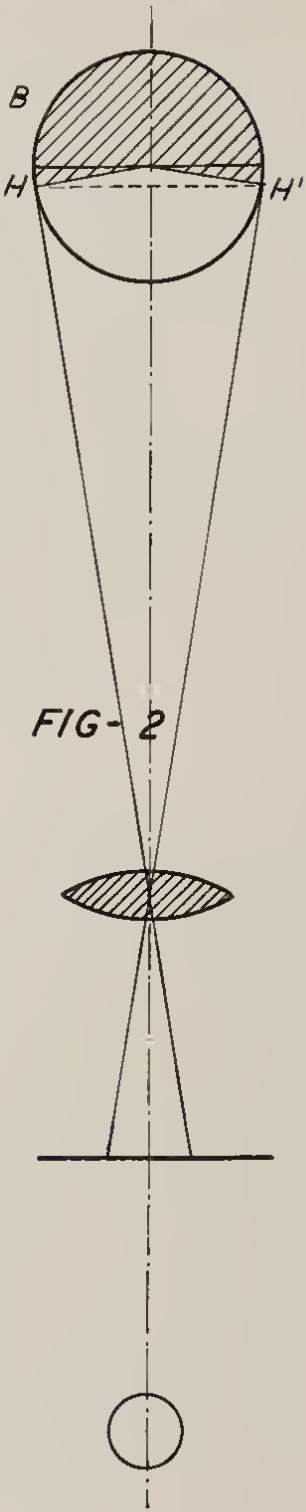


FIG-2

Screen Definition

by **DR. L. M. DIETERICH**
Consulting Engineer

THE INSTANTANEOUS flexibility of the human optical system is of a degree of perfection so far not attained by any photographic system or any projection system or any combination of such systems as the following analysis endeavors to show to the lay mind

When we look at a landscaoe through a window, for example, and assume that both of our eyes are normal, we find, that in viewing the whole depth of the visual field without special attraction by any part thereof—our sharp sight ranges continuously throughout the field in a three dimensional manner like an ideal television scanning device

For a given focal distance the eyes range in a rapidly oscillating, extending and contracting spiral, pulsating at the same time throughout the whole depth of the field

This complicated, practically instantaneous displacement of sharp point-focus can be likened to a spiral watch spring contracting and expanding like the balance spring in a watch If we can visualize that at the same time the center of such balance is synchronously pulsating along the shaft, forcing such balance into a periodically increasing and decreasing conical shape and if we further try to visualize that the point focus is at the same time travelling along the length of this spiral from the center towards the periphery and vice versa and that this complex oscillatory motion takes place in a fraction of a second—then we get an idea of a part of the amazing optical perfection of the human sight

This complicated three dimensional rapid spiral scanning, however, includes a synchronous automatic change in the momentary optical characteristics of each eye and an automatic, ever-changing balance between these changes of both eyes

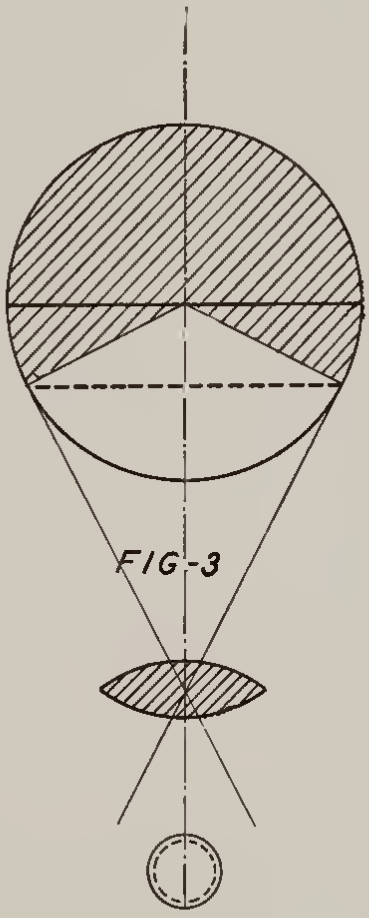
In the above described three dimensional ranging each eye changes in its wandering from point to point in the field, its focal value by so-called accommodation or in physical fact by the unconscious muscular control of flattening or bulging the crystal lens At the same time the involuntary change of the size of the pupil (lens-aperture) is automatically and instantaneously controlled by the brightness of the point upon which the eye is focused This modern thesis however holds good only for the comparatively small field or physiological angle surrounding the optical axis of the edge when it is endeavoring to focus on a single point

These automatic changes of the optical characteristics of the two human eyes occur independently of each other Their retinal results, however, are blended into one nerve sensation by the again instantaneous and automatic convergence of the optical axes of the eyes, resulting from the involuntary adequate revolving of the eyeballs and resulting in the intersection of the two optical axes at the point of the field under momentary visual observation

Diagram Fig 1 shows approximately the optical coordination of both eyes for such a momentary condition of sight

B is the object point of concentrated sight, for clearness sake assumed to be a ball. The optical axes A A^1 of the eyes E E^1 intersect in the center of the ball B

The distance of each eye from the ball being the same, the total perception of the surface of the ball is for each eye determined by the same physiological angle and the total visual surface of the ball is controlled by the angle D The surface F F^1 is seen by eye E and the surface G G^1 by eye E^1 The overlapping of these momentarily visual surfaces shows us a binocular perception of surface G F^1 and respectively monocular perceptions of surfaces F G and F^1 G^1 By the convergence of the optical axes A A^1 a total ball image is shown on a spot of each retina identical in its respective position to each individual optical axis



These identical conditions of size and retinal location produce in their overlapping angular values the three dimensional nerve reaction which we call the stereoscopic effect

Diagram Fig 2 shows the same ball photographed by a lens of the same focal value as the above assumed momentary focal value of the human eyes with the same distance between the ball and the lens

The visual surface of the ball is for this lens controlled by a physical angle which we can assume to be equal to the physiological angles of the two eyes

(Continued on Page 271

Hal Hall SAYS

The World's Football

I HAVE often wondered why so many writers, near writers and would-be writers use so much space in papers, magazines and pseudo-smart magazines knocking everything pertaining to the production end of the motion picture industry

It would seem that the old custom of selling life insurance when you cannot do anything else has changed to knocking the film producers when you cannot do anything else The motion picture industry seems to have become the world's football to be kicked around at sundry and all moments by people, in many cases, who would in all probability make more mistakes in a minute than the average producer makes in a year

True, the film producers make blunders—terrible blunders But what of it! Why does some young whippersnapper fresh from college, or some old timer who, often, is sore because he or she cannot get a studio job, think he or she has the sublime right to sit down and criticise men who have forgotten more than a lot of them will ever know? At times this criticism grows absolutely sickish A lot of foolish tripe handed out mostly by people who have never had a day of experience in the business of making motion pictures Isn't it nearly time it was stopped?

Some of these criticisers remind me of a crowd of little puppies snapping at the heels of a big, good-natured St. Bernard dog And their blurbs mean just about as much to the world as do the barks of the pups.

A big department store fails There has been poor management But you do not see huge blurbs—nasty, cheap, cowardly attacks made upon the store executives by newspaper or magazine writers A big oil company fails to pay its regular dividend There is nothing said A big steel company reduces its yearly dividend by more than half But there are no sore-heads writing sarcastic comment about the inefficiency of the steel executives

Then, why shoot at the motion picture business? What if the producers do waste money It isn't anything out of the pockets of the writers who criticise What if they do make some bad pictures It is the picture company that suffers. Why shout about it? It is none of my business how the boss of any studio runs his studio, so long as he does not injure me Then, why the nasty criticisms?

An English professor at Brown University told us one day, years ago when we were in the college class, that "those who can, do; those who cannot, criticise" Maybe he was right.

●

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This Month's Cover

A COMPARATIVE new-comer to the screen is seen on this month's cover of this magazine She is Frances Dade, a very personable young lady, whose advent into pictures has been a decidedly pleasant one and her future looks very promising

Miss Dade really should be a good actress because her mother, Frances Pemberton, was an accomplished stage actress who played with no less a star than Joseph Jefferson Miss Dade is a native of Philadelphia Her first stage experience was in "Gentlemen Prefer Blondes," a small part. Her first real opportunity came in "Escapade" She had never given pictures much thought until one of Samuel Goldwyn's scouts saw her in a Broadway play and asked her to call at the Goldwyn office A screen test was made and shipped air-mail to Hollywood, with the result that Miss Dade was given the ingenue role in "Raffles," in which Ronald Colman was starred After finishing this picture she was loaned to R-K-O where she played the feminine lead in "He Knew Women" Paramount then borrowed her from Goldwyn who had given her a contract, and she played opposite Cyril Maude in "Grumpy."

Her most recent pictures include "Mother's Millions," "Daughter of the Dragon" and the lead in a Ken Maynard Western Miss Dade is a very sensible young lady, and proves it beyond a doubt by having the able and scintillating Scoop Conlon as her publicity representative.

●

Cinematographic Annual

DAILY, numerous letters reach our desk inquiring about the second volume of the Cinematographic Annual

Remembering the embarrassing delay in the delivery of Volume One last year, we have held up our announcement regarding Volume Two until we were certain of delivery date Yes, there will be an Annual this year Volume Two, Cinematographic Annual, will be off the press the first week of November and deliveries will start about November fifteenth

It is gratifying to note that scores of orders for the second volume have already been received at this office, and the orders are coming in daily. It makes us feel that the first Annual was really worth while And we can promise you that the second volume will be infinitely better Eleven months of effort already has been put into the book and we sincerely hope that you will all like it The scope of the book has been broadened a bit, and there will be something of interest to everyone whether he be connected with the motion picture industry or be an amateur cinematographer or just a snap-shot enthusiast The pictorial section has been enlarged to 64 pages, and the pictures will delight the souls of picture lovers

Sound, Cinematography (professional and amateur), Laboratory, Projection, Art—all have their place—all handled by men whose names are known the world over. If you have Volume One, you will surely want Volume Two—and if you missed the first volume, we suggest that you send in your order for both volumes, as we have a very few of the first issue left First come, first served

1 —*Listen old timer—when are you going to give me a break on the outside?*

2 *I'm plenty sold on this* **Eastman Panchromatic** — *it's certainly done wonders for me*

3 *I had a big kick out of that superpan that we shot—*

4 —*and then when we [illegible] anti halo on me—I was out [illegible]*

5 *I [illegible] big glass [illegible] could [illegible] What a [illegible]*

6 *Remember how it wowed the bous at Metro and Paramount and RKO?*

7 *Depression my eye. Guess that's one thing our anti halo is* **not** *sensitive to—*

8 *But on the level now—do you mean to tell me that any of the boys are still on the fence?*

9 —**What** *Hey lemme out of this thing!*—**I'm Going To Work—**

Putting the Realism Into "Dirigible"

(Continued from Page 15)

ture we had to build was so huge that it absolutely had to be built right on the floor of the stage, otherwise, we would have had to have ripped off the roof! So I was up against it good and proper to contrive to light the thing properly After quite a bit of grief, I finally hit upon the plan of using the new Mole-Richardson "Sky Lights," which had just been introduced

Mr. Walker at camera shooting a sequence of "Dirigible"

These units consist of a very shallow aluminum reflector, with no barrel at all I laid these on the floor under the doped linen cover of the framework, about four or five feet apart, and interspersed them with ordinary broadsides under the observation holes These, with the feeble assistance of the practicals" (in this case the small, frosted incandescent lamps, which, strung along about ten feet apart over the cat-walk illuminate the interior of the actual ship), furnished all of our lighting These scenes were intercut with those actually taken on the "Los Angeles" and the lightings matched so well that I, myself, could not tell which was which

Another rather interesting scene from the standpoint of the lighting and photographic problems it offered, was the vast snow-field which we built out at Arcadia Mr Briskin's desire for absolute realism sensibly stopped short of sending the company to the Antarctic for our several snowfield sequences, and Antarctic conditions are not duplicated in any of our nearer snow-sections, nor in the actual Arctic, so we built ourselves an Antarctic in Southern California It was no miniature, for it had to be large enough to allow a real Tri-motored Fokker transport plane to land, take-off, and, eventually, to crack up So we covered a large area with the conventional movie snow materials—bleached cornflakes, marble-dust, and the rest, interspersed with the necessary rocks, ice-cakes, and mountains The glare that this produced under a California sun can, perhaps, be imagined What a problem it was to make it look properly cold and barren! The sound department ruled out our good old standby of silent days—blue-tinted film, so it was up to us to achieve our effects entirely with the camera The result was that we shot the scene through so many filters that we could hardly see the image on the ground-glass of the camera But even with properly heavy color filters and three or four Neutral Density filters, there was quite enough left to impress an image on the film—and we were successful in getting across the impression of the cold barrenness of the Antarctic

But, after all, perhaps the scene that gave me the greatest personal pleasure of all was one of the least spectacular ones in the film It was a close-up of the leading lady, Fay Wray, which I made with a lens which I had designed and had built myself For some time I had had the idea of making a soft-focus lens of certain definite characteristics, and finally, just before starting 'Dirigible," I had found time to design the lens and have it ground Then, during the production of the picture, came a single scene where I felt that it would be of real value It was in the scene where Miss Wray is bidding good-bye to her husband, who is setting out, against her wishes, for a flight to the South Pole. she feels that she will never see him again, whether he returns or not I had photographed the scene in the conventional manner, with gauzes and diffusion discs, Miss Wray had given a magnificent performance But I felt that I could make the scene even more telling with my new lens I broached the subject to the director, he refused, as he felt unwilling to call on Miss Wray to repeat such a harrowing scene after it had been photographed so well, and acted so perfectly But when I asked Miss Wray, she was quite willing to repeat it for me, so I mounted the lens on the camera, and we made one more take When the rushes were seen, all of them, even Mr Capra, agreed that my lens had really made a fine scene better And that, to me, was the greatest thrill of the picture, for the rest was all in the days' work, but this was more than that—it was my own individual contribution to making 'Dirigible" an outstanding work of motion picture craftsmanship

●

Len Roos Abroad for Tanar British Factory Opening

LEN H ROOS, A S C, F R P S, vice president and general manager of the Tanar Corporation, Hollywood, left Hollywood the last week in July for London and other foreign cities Mr Roos goes to London for the official opening of the British Tanar factory which takes place this month.

The foreign business of the Tanar Corporation has grown so much, according to Mr Roos, that a British factory seemed advisable It is indicative of the remarkable growth of this organization which was started by Mr Roos less than two years ago for the manufacture of portable sound-on-film equipment.

Mr Roos will go from London to Paris, the Hague, Barcelona, Brussels and Berlin for the establishing of branch agencies in those cities He will be met in Paris by Mr Merkel of the Tanar foreign department, and the pair will travel together throughout Europe Mr Roos expects to be gone several months

●

"Armor Plated" Film Being Put On Market

"ARMOR plated" film, on which the perforations are protected by a thin copper band, is being put on the market by Precision Engineering Co of Philadelphia N Pederson, president and general manager of the company, is also the inventor of the process, which is guaranteed to prevent tearing or 'breaks" due to worn perforations The copper band is so attached to the film that it cannot loosen, although it does not enter the 'field" of photography British rights are said to have been sold for a large sum of money Pederson is expected in New York next week to make American distribution arrangements

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Four Musketeers

(Continued from Page 9)

tory work is of very poor quality I must, however, except the Japanese laboratories from this stigma, for the many stills which we had developed in that country were most capably handled.

While we were in China, we were entertained by Mei Lan Fang, who is probably the greatest of Oriental actors Of course we filmed many scenes of him and of his home, one bit which I still remember with amusement was a sequence in which he and Doug exchanged clothes and personalities both men have a fine sense of comedy, and it is hard to say which was the more ludicrous, Doug's attempts to look and speak Chinese, or Mei Lan Fang's imitation of Doug.

In Japan we had the unique experience of visiting one of Japan s picture studios It is difficult to believe that the studios of Japan annually produce more feature pictures than do our own plants in Hollywood But these remarkable people have been producing motion pictures since 1897—two years after the importation of the first foreign reel Today there are nearly 1,400 theatres in the country, the majority of which show Japanese films exclusively There are about a dozen producing companies in the country, the largest of which produces more than 100 feature films per year the total production for the country is in the neighborhood of 600 features each year Viewed by American standards, their production costs are amazingly small, averaging about $10,000 per picture Naturally, their technical facilities are somewhat limited, but it is astonishing to see what creditable results their cinematographers manage to achieve Despite the large domestic production, American films are very popular, and as Doug is their greatest favorite, he was lionized everywhere he went To my surprise, I came in for a good share of this popularity myself, not only because I was a member of Doug's party, and had photographed several of his pictures, but because I was a cinematographer The Japanese are enthusiastic photographers, and both the amateurs and the professionals follow the work of our American cinematographers as zealously as our own fan public follows the careers of its favorite stars When we went to visit the Kamata Studio, I was amazed when the Kamata Studio Cinematographers Club welcomed me by presenting me with a membership, a beautiful pin, and a scroll upon which was inscribed the titles of every picture that I had photographed! It is, in fact, very difficult to describe the veneration in which the Japanese professional cinematographers hold the professional cinematographers of this country

In the Philippines, Doug called on General Emilio Aguinaldo, the famous leader of the Philippine insurrection of a few decades ago We added the General to our photographic 'bag,' and found him, in the process, a most interesting gentleman

In Cambodia, our greatest adventure lay in our visit to the mysterious and beautiful Angkor Vat, a vast and wonderful temple-city built by the forgotten Khmers· who they were, no one knows, nor where they went, but they left behind them an unforgettable monument in this great temple Of course we photographed it, and got not only scenes showing its impressive size and beanty, but more familiar scenes of Doug doing his acrobatic stunts among its towers and terraces

Then off again to Bangkok, for Doug was all agog over the possibilities of elephant hunting in Siam Before launching on this thrilling pursuit, we were received in Bangkok by their Majesties King Prajadhipok and Queen Rhambai Barni Their Majesties are most democratic, and their personal charm is sufficient even to rise above the formality of a Royal presentation Later, in more informal conversation, I found King Prajadhipok to be most intensely interested in cinematography, both as a personal recreation and as a vital government project His Majesty has a very complete camera and laboratory equipment, both for 16mm and 35mm work The Siamese Government has a special department devoted to the production of educational films, which form an important part of King Prajadhipok's policy of modernization The importance of the department may be judged by the fact that it is headed by the King's uncle, Prince Svasti.

One evening we were invited to the Palace, where we were privileged to view a picture which had been personally directed by the King It was most interesting, particularly as it showed the enthusiasm with which this progressive ruler is adapting the film to serve the needs of his people The photography suffered considerably because the film used was the old orthochromatic stock rather than panchromatic and particularly because the cinematographer had been too polite to use reflectors, which, he told me, bothered his actors

India, after the friendly, cheerful people of Siam, was rather an anticlimax, for her people seem to suffer from inherent suspicion and melancholy Until I visited India and China, I had never appreciated the meaning of the phrase "teeming millions" There is far more than humor in the remark of the traveller who, when asked about China dryly replied that it was 'vast—and full of Chinamen" The congestion of population of both these countries must be seen to be believed

Nevertheless, our hosts in India, both British and native, spared no effort to make us comfortable and happy Doug was in his element—splendid companions, thrilling hunting and plenty of golf Our hosts arranged several tiger and leopard shoots for us, and very spectacular affairs they were The hunting is done from elephant-back—a very prudent method, since My Lord, the Tiger, is a very fierce and wily customer, and quite capable of evening the apparent odds that high-powered rifles and elephants seem to lay against him Photographically, a tiger-hunt is a very spectacular subject, and a very difficult one The long line of hunting elephants, the sudden, lightning-like rushes of the tigers, the picturesque native beaters and mahouts all combine to make a most unusual picture At the same time, it is far from a perfect subject for photography The lush greens of the jungle, and the thick foliage overhead do not form a particularly actinic background The cameras are, of course, carried on elephants, and although they are certainly large enough to be a very nice camera-platform, they are not at all times as stable as a studio parallel But it is the tiger himself who is the greatest problem, for no one can ever tell just when or where he will break cover and when he charges, he does so with incredible speed For this reason, after the first attempt, I practically abandoned my big camera, and used the Eyemos entirely How thankful I was for them! I could hold them in my hand, at the ready, like a hunter's gun then when Mr Tiger darted out, I had at least some chance of getting a picture of him—a literal snap shot Doug bagged several tigers and leopards, and I had equally good luck in bagging them with my cameras

All along our route, Doug found his favorite diversion—golf—in abundance We golfed in overcoats in China, and in shorts and topi in India We even golfed within a stone's throw of the superb Taj Mahal at Agra And we golfed with so many different types and races of people that Doug now claims that he can play golf in any language!

Even thicker than the golf-courses were the users of amateur cine-cameras It seemed as though every tourist and half the richer natives had at least one All of them, of course, were eager to photograph Doug And when they learned that I was a professional cinematographer, I, too, was mobbed If Doug was deluged with requests to pose, and for autographs, I was almost as completely submerged by questions on exposure, on focusing, on film, on filters, on lighting, on "how do they do it in Hollywood" (which covers a multitude of sins!), and on every other subject imaginable; but first, last, and always on exposure Even those that used really accurate exposure-meters seemed to prefer to trust my professional judgment of such matters In the jungles in India it seemed very difficult for them to believe that, although the intensity

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Du Pont Panchromatic Negative Film

by **DR. V. B. SEASE**
Director Redpath Research Laboratory

DO you remember the motion picture of a decade or two ago—its chalk and soot silhouette, its granular, squirming structure? Contrast that picture with the smooth texture, the lifelike relief and gradation in light and shadow of the modern cinema Many things have contributed to this improvement, but one of the most important has been the introduction of panchromatic negative film.

Du Pont takes a just pride in the part it has played in furnishing such a negative film for the motion picture industry. This accomplishment is one of its best examples of applied research The company's experience in producing nitrocellulose made the manufacture of celluloid film a logical undertaking So a comprehensive investigation of the fundamental principles underlying photographic emulsion manufacture was conducted over a period of six or eight years with the idea always in mind that only a superior product could justify the entry of the du Pont Company into the motion picture field The result was a photographic emulsion with very fine grain, high sensitivity to light, long scale of density gradation and a wide latitude in exposure and development Some of these qualities had been achieved to a certain extent in the industry before, but never had so many desirable characteristics been incorporated in a cine'film

This emulsion, however, was only sensitive to the blue wave lengths of light To preserve its valuable qualities and make it panchromatic—that is, capable of recording in gray tones all the colors visible to the eye—required much more research

Earlier experimenters had demonstrated the broad principle of color sensitizing photographic emulsions by the addition of certain dyes Minute traces of these dyes, insufficient to color the silver grains or the gelatin in which the grains are suspended, are absorbed by the silver grains which thereafter show enormous increase in sensitivity toward light of certain wave lengths The wave lengths favored depend upon the specific nature of the dye that is used

The present high-speed panchromatic negative is a product of intensive research in the synthesis of new dyes, the study of the relationship of structure of a dye molecule to sensitizing action, the manufacture of particular types of silver suspensions receptive to these dyes, and the methods of incorporation of the dyes to produce the maximum sensitizing action.

Not only has panchromatic negative helped to bring about a great improvement in the quality of the screen, but it has made possible the revolutionary changes that were required in studio lighting with the advent of sound pictures The old type of arc light supplied an intolerable amount of extraneous noise The incandescent lamp is ideal from the standpoint of silence, but it could not have found a place in the modern studio if panchromatic film had not been available The incandescent lamp is relatively weak in blue, the rays necessary for action on the old types of negative It is rich in yellow and red rays and the panchromatic film can make full use of practically all incandescent emission

This special fitness of panchromatic film for incandescent lighting not only brings about a considerable saving in current but gives the actors a more normal environment The powerful lights of the former days were not only uncomfortable but often injurious to the eyes of the players and studio workers

The sensitivity to incandescent light of the special du Pont panchromatic brought out this year is at least double that of the regular product which has been so universally approved during the past four years In actual productions at Hollywood it has been found necessary to reduce lighting amperages by one-half It is sufficiently sensitive to take night scenes on Broadway or similarly lighted thoroughfares without the special hypersensitizing treatment heretofore necessary

Entrance to the Dupont Film Plant in New Jersey

Still by John Ellis

JOHN BARRYMORE and MARIAN MARSH

in

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VOLUME 2

Cinematographic ANNUAL

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AMERICAN CINEMATOGRAPHER

1220 Guaranty Building Hollywood, California

..In the Realm of Sound..

The Operation and Uses of the Rapid Record Oscillograph

THE RECORDING oscillograph is the stethoscope of the sound engineer Just as accurate diagnosis precedes the doctor's prescription, the scientific control of sound in its infinity of complex combinations is dependent on a means of analysis and evaluating its components Such analysis must be made easily, quickly and accurately

The rapid record oscillograph recently developed by the Bell Telephone Laboratories and now in use by the Acoustic Consulting Department of Electrical Research Products in its acoustic work fulfills these requirements in the form of a permanent photographic image of any sound picked up by the associated microphone Pure tone or complex frequency from 30 to 6000 cycles is recorded on a graduated strip of paper, 35mm in width, the coordinates of which indicate directly the frequency, pressure and duration

In its application to sound analysis, the output of the associated microphone is impressed on the string of a specially designed galvanometer The string is of duralumin less than .001 inch in diameter stretched between the poles of an electro magnet and tensioned to a definite frequency. Suitable attenuation at the point of natural resonance results in uniformly linear response Transient currents from the microphone passing through the string cause it to vibrate in proportion to the amount of impressed energy Three such strings provide means for simultaneously recording data from as many sources, but any of the galvanometer strings may be used independently of the others.

By means of a very simple optical system and a tungsten lamp as a source of light, the shadow of the vibrating string is projected upon a moving strip of sensitized paper In a similar manner, abscissa lines are projected on the oscillogram from a screen of parallel lines engraved on the optical system Ordinate lines are obtained from the projected shadow of the spokes of a synchronously rotated wheel and represent time intervals of .001 second. The shadows of the strings and coordinate lines appear on the developed oscillogram as white lines strongly contrasting with the dark grey of the portions which were exposed to direct light

The photographic mechanism is essentially a complete camera and laboratory where the sensitized paper is exposed and passed through the developing and fixing solutions automatically. The speed of the paper through the light beam may be set within very wide limits, but at its maximum approaches a rate of 15 miles per hour As this is much more rapid than the permissible rate of processing, it was necessary to provide intermediate storage for the exposed paper. This is accomplished by a light-proof storage tank where it is loosely folded until automatically withdrawn by the conveyor belts leading it through the process tanks

The average oscillogram is available for inspection within one-half minute from the time the exposure trigger is released, and if it is wanted for further reference or enlargement may be completely dried within fifteen minutes Extreme sharpness of the image makes possible enlargement to four or five times original size for minute inspection where desired, but this is seldom found necessary

In the study of sound, the rapid oscillograph has proven extremely useful It has simplified the scientific analysis of interference phenomena and distribution of sound energy because of the ability to record simultaneously the initial sound at its source and the resultant sound energy received at widely separated locations in the auditorium It thus becomes an instrument with which the acoustical engineer may qualitatively inspect reverberation characteristics while relying on the reverberation meter for a more complete and detailed study

Absence of distortion and extreme simplicity of operation have developed useful applications of the rapid oscillograph in many fields For investigation of sound recording and reproducing equipment, amplifier and tube characteristics and in all research where oscillograms of audio frequencies are desired has proven most useful

●

Three-Lens Turret Makes Exact Position Possible

A THREE-LENS turret that will accommodate three lenses of any size necessary for the presentation of sound-on-film, disc, silent or Magnascope, is being offered by Basson & Stern, sound accessory device manufacturers of Brooklyn With the use of this turret, exact position register is possible, the company states Each lens has a separate focusing device, and there are also provided adjustments for up-and-down and sideways movements of each lens, thus insuring exact line-up of picture on the screen without it being necessary to shift the projector

●

Weber Corp. Supplying Synchrofilm A. C. Units

COMPLETELY new A. C.-operated power supply units, designed for the elimination of all batteries from the new Synchrofilm sound equipment and for replacements for batteries in use with equipment installed, have been developed and are now being offered by the Weber Machine Corp of Rochester, N. Y.

The equipment is made in two units, which consist of an "A" unit for the supply of current to exciter lamps and also for the filaments of the head amplifier tubes, and a "B" unit for supplying plate voltage to the head amplifier tubes and photo-electric cells

All units are ruggedly built, on pressed steel chassis, and are supplied with ventilated steel cabinets for wall mounting The entire assembly and wiring of the component parts make a compact and efficient unit, the method of wall mounting having proven very desirable in projection rooms where the floor space is limited, it is declared.

●

Portable Public Address System

A COMPACT portable public address system known as the Amplion Portovox, consisting of an Amplion unit, exponential horn, amplifier and microphone, and which can be packed in two small packages for transportation, has been put out by the Amplion Products Corp of New York

Laboratory Department

Conducted by **EMERY HUSE, A. S. C.**

Principles of Sensitometry and Their Practical Application

Part 4

EXPOSURE

A DEFINITE concept of the term "exposure" should be had before a detailed discussion is entered into relative to "sensitometers"—those instruments by which controlled exposures are made in the practice of sensitometry

The problem of the exposure of a photographic material involves the intensity of the light source and the time of exposure expressed in seconds The proper combination of these two elements will produce after correct development a range of densities dependent upon the speed of the emulsion and which will be proportionate to the brightness (intensities) in the object photographed Exposure is usually defined as

$$E = I \times t$$

where "I" is the intensity and "t" the exposure time in seconds

The intensity of the light source is usually expressed in terms of meter-candles so that the exposure is finally expressed in terms of meter-candle-seconds

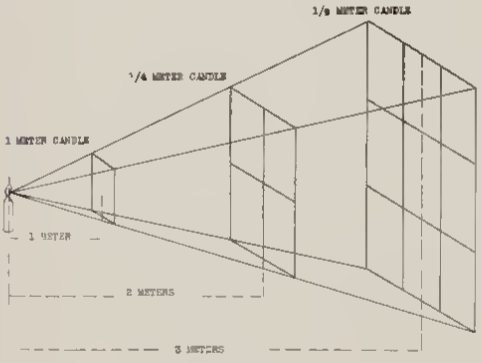

Fig 2

A meter-candle may be defined as the brightness of one candle power falling upon an object at a distance of one meter If the brightness of a source is 10 candle power and the distance one meter, then we have on the object a brightness of 10 meter-candles If we change the distance between the source of the illumination and the object the brightness will vary inversely as the square of the distance because the cone of light which covers a definite area at a meter will at two meters embrace four areas of the same size At 3 meters, 9 areas will be embraced and so on, and since the same light that falls on one area at one meter is spread over 4 areas at two meters, it is naturally only one-quarter of the strength on each of the 4 areas Bearing this in mind, if a light source of 25 candle power is acting upon an object at a distance of one meter, by use of the same reasoning as previously applied, that object will be illuminated by 25 meter-candles Now, if this object is photographed and the time of exposure is one second we have as a result an exposure equivalent to 25 meter-candle-seconds To expand a little further, if we move the 25 candle power source so that it is 2 meters from the object, the intensity then becomes one-quarter of 25 meter-candles, or 6¼ meter-candles This is computed from the above statement that as the distance changes the intensity will vary inversely as the square of the distance In this case we have increased our distance by a factor of 2, and 2 squared is 4, hence the intensity at the increased distance must be one-quarter of the previous value Figure 2 illustrates diagrammatically this intensity as the object distance from the source is altered

All of the foregoing represents a condition which may be set up in a test laboratory. In the photographing of persons and scenes the brightness of the various objects to be photographed can be measured by an instrument known as the "illuminometer" It is, therefore, possible to measure actual brightness in a scene of any type so that knowing the time of exposure and the degree of development the resulting photographic effects can be precisely determined

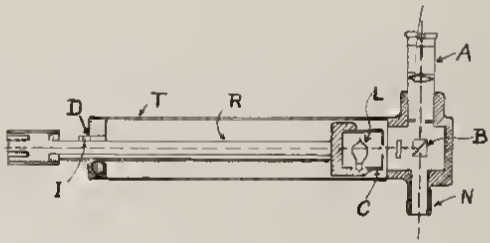

Fig. 3

It will be well to diverge for a moment and discuss briefly one of the well known illuminometers which is used for this type of work The instrument referred to is the Macbeth Illuminometer which is manufactured by the Leeds and Northrup Company

The essential part of this instrument is shown diagrammatically in Figure 3 It consists of a telescopic eye piece "A" a Lummer-Brodhun Cube, "B", and a diaphramed lamp carriage 'C", which is found in the tube, "T' The lamp carriage carries an electric lamp, "L", which is the working lamp carriage and is moved up and down in the tube by means of a rack and pinion operating upon a square brass rod "R" to which the carriage is fastened The rod is seen projecting from the bottom of the tube at 'D"; On one side of the rod to which the lamp carriage is attached is engraved the correct reading scale calibrated from 1 to 25 foot-candles These values can be converted readily to meter-candles by using the value of 10 76 as a multiplying factor,—thus,

Meter-candles = 10 76 x foot-candles

An index point is attached to the bottom of the tube at "I" The scale on this instrument follows the inverse square law previously mentioned.

In addition to the part just described, the Macbeth Illuminometer contains a second piece of equipment which is called the "Controller" The controller comprises a battery for operating the lamp, a mil-ammeter, and two close regulating rheostats, all essential for the proper manipulation of the instrument To use the instrument, the nose piece "N" is directed at the area whose brightness is to be measured or at a test plate supplied with the instrument This test plate can be placed in the field of view and a photometric balance obtained between two concentric circles which are visible within the instrument upon looking through the eye piece One circle is illuminated by the light from the working standard within the instrument, while the other is illuminated by the light from the light source under measurement This instrument is very easy to manipulate and is very reliable from the standpoint of the quality of the results obtained

●

Screen Definition

(Continued from Page 17)

The size of this surface, photographed as a circularly bounded image, is controlled by the diameter of the circle H H^1 which is smaller than the actual diameter of the ball shown as a full line This difference is more clearly shown in Diagram Fig 3 where relative values of ball size and lens distance are intentionally exaggerated

The surface seen by each human eye is under the assumption of similar ball size and distances the same as photographed by the lens The overlapping binocular retinal and nerve effect, however, produces a brain image of somewhat elliptical configuration, the major axis, controlled by the full diameter of the ball lying in the direction of the parallax of the eyes, the minor axis at right angles thereto being controlled by circular surface of smaller diameter than full ball diameter

It is the perception of and brain reaction to this distortion which produces the so-called stereoscopic effect

That the eye is especially sensitive to distortions in the parallactic direction is the reason why we see any photograph or other normally produced picture with an enhanced depth effect when we look at the same through an **uncorrected** positive lens system

The eyes respond to distortions so produced only by the higher parallactic sensitivity and the distortions in other directions are suppressed, with the result that our nerve reactions impress upon our sight sense a picture similar to that of the three dimensional objects itself

The comparative analysis of a modern binocular photographic system as used in so-called stereoscopic cameras shall be taken up in the next article

●

Technical Products Co.

"JACK" MARSTON, formerly with M-G-M Studio, Camera Repair Shop and who was with them over 6 years is now connected with Technical Products Co, Hollywood, in charge of their shop This company has been doing studio equipment and camera repair work for nearly a year They make all kinds of special attachments, such as lens mounts, matte boxes, 16 mm. camera equipment, etc Also the Technical Products Co are developing some specialties of their own

Off for the North

HERE we have Glenn H Kershner, member of the American Society of Cinematographers, and the noted explorer, Donald B MacMillan, aboard the good ship, Bowdoin. Mr MacMillan is making his fourteenth exploring trip to Labrador This time he took Mr Kershner along to make a cinematographic record in Multicolor Mr Kershner flew from Hollywood in a plane that has been taken on the expedition Most of the photographic work will be from plane.

●

Chinamen, About to be Executed, Strive for Creditable Movie Camera Pose

IF YOU were about to be executed, would you worry about how you would appear to a movie camera?

W H Jansen, A S C, well-known news-reel cinematographer, now in America for a short stay, took many moving pictures of executions in China in connection with the Canton Red uprising, and he says that man after man just about to be shot by the executioner would direct his last glance to the lens of the camera and assume the best possible pose

Mr Jansen used an Eyemo movie camera all through those turbulent Canton days He says things were frequently moving too fast to permit a photographer allowing himself the time to set up a tripod

Mr Jansen, who has been in China for the past nine years, is visiting this country to secure proper equipment for making sound pictures in the Far East

He is especially enthusiastic over the possibilities of talkies in educational work in China.

"For nearly a decade silent moving pictures have been used to an increasing extent as an educational medium in the Orient," he says, "but sound pictures are sure to be more extensively used"

He is planning the production, in China, of sound pictures on such subjects as hygiene, good citizenship, and agricultural methods for use in Chinese schools He also plans to produce authentic sound pictures for use in other countries on interesting phases of life in China today

Mr Jansen was elected to membership in The American Society of Cinematographers last month

●

Six Location Films Scheduled by Radio

RADIO Pictures has made plans for the part filming of six productions on location The pictures listed under this category, according to William LeBaron are "Marcheta," which will be filmed partly in Barcelona and Madrid, Spain, "The Bird of Paradise," with an Hawaiian setting; "The Dove," in Mexico, "Pent-house," New York City and Wyoming, "Frontier," in the Dakotas, and "Home Town Laughter" on a distant site now being sought by Director Gregory La Cava

The

ultimate

IN

SOUND-ON-FILM RECORDING

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General Sound Corporation, Ltd.

GRanite 4141 Station 107
5630 Melrose Ave Hollywood

A Romantic Journey

(Continued from Page 13)

"One of the most interesting parts of the trip was a 4500-mile automobile trip, mainly through desert wastes. They have specially equipped automobiles down there with twelve wheels for use over the desert. Where the ordinary automobile would sink hopelessly in the sand these cars roll along as though on a concrete highway. Mile after mile we traveled over desert where the shifting sands had entirely obliterated the trail. But concrete posts marked the way, and all we had to do was to follow them and we knew we would not become lost.

"Every now and then we would arrive at an oasis, perfect little paradises with cool, sweet water and drooping date palms. We continued on into the interior to Fort Morocco at Quadzazet. This is the farthest inland post of the famous French Foreign Legion, and is the outpost of civilization down there. Standing on the walls of the fort you are shown a small river just a short distance away. That stream marks the danger line for travelers. Across that line are the fightingest Riffs in the world. To cross the river invites a bullet. Likewise if they cross to the fort side a bullet sings at them. A pretty spot, but not one where you would wish to settle down.

"From Africa we crossed the Mediterranean to the South of France. Through France we photographed scenes for our pictures, and then we went on into Germany where we made some really outstanding pictures. One scene was at Heidelberg where we photographed a group of real students of "Old Heidelberg" singing the stein song at the very scene of "The Student Prince." I think the producers rightly named this series of pictures when they called them 'Romantic Journeys,' for we had a romantic journey in their making."

●

Raytar Lenses Ready for Distribution

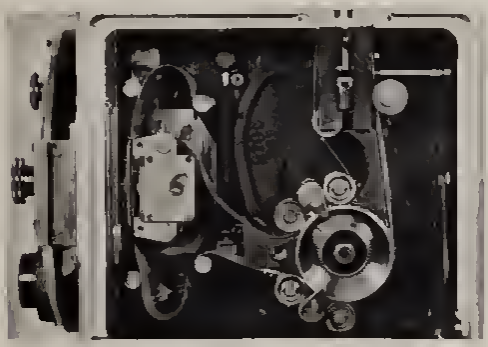
BAUSCH & LOMB Optical Company has appointed the Mitchell Camera Corporation, Hollywood, California agents for the distribution of their new Raytar Motion Picture Lens. A stock of lenses is carried on the west coast and orders can be filled promptly.

Erpi Engineer Honored

DR. JOHN G. FRAYNE, consulting engineer in the West Coast recording department of Electrical Research Products, has been awarded the grade of Fellow by the American Physical Society, a distinction reserved for scientists of outstanding accomplishments.

An Amateur Afield Drawn by Ransom Hall

New Bell & Howell Standard Camera Silent Unit "I" Mechanism



Silent unit "I" pilot pin mechanism in B. & H. standard camera showing threading and arrangement of roller assemblies to eliminate loop slap

ALL CAMERAMEN are familiar with the fixed type of registering pilot pin which was an exclusive development of the Bell & Howell Company for their standard cameras

Since the inception of sound, there has been a long felt need for a mechanism that would give the positive and particularly exact registration obtained with the familiar B & H pilot pin mechanism, but which would be silent enough to use on a sound stage. The Bell & Howell Company is, therefore, particularly pleased to advise that this has been accomplished in the new Silent Unit "I" pilot pin mechanism.

The little roller which engages in the main cam is now made of fibre, and the two slides which engage on the periphery of the main cam are equipped with fibre inserts. The oscillating rocker arm and register leaf parts are cut away and lightened as much as possible without sacrifice of rigidity and safety.

While these silence the mechanism considerably, two other improvements have been developed for further silencing the camera equipped with this mechanism.

First, the camera itself has been equipped with a special cam. The stroke of this special cam is about one-half of that employed in the regular camera. The idea of this is that the shortened cam controls the stroke of the register leaves exactly to the minimum possible limits of movement necessary to secure perfect results. The cam is arranged so as to prevent the register leaves from "slapping" against the aperture, thus eliminating the main source of noise.

The second improvement is the little ball bearing roller assemblies, one set of which is installed in the camera frame itself, and the other set in the angle plate of the mechanism. These rollers serve to control the loop as shown in the photograph, and eliminate loop "slap," the second greatest cause of noise.

All in all, this development represents a definite improvement. It is attracting great attention due to the fact that the mechanism can be readily adapted to take bi-pack films, thus giving a silent, color camera. By merely interchanging mechanisms, regular black and white pictures can be obtained without adjustment to the focusing ground glass or any other makeshift arrangement for compensating for the difference in the focal planes of regular and bi-pack films.

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Amateur Movie Making

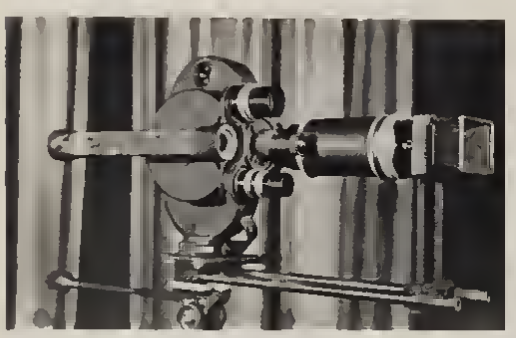
by WILLIAM STULL, A. S. C.

FROM the viewpoint of the professional cinematographer—or that of the advanced amateur—perhaps the greatest defect of 16 mm cinematography is that it does not permit the use of professional filters. This is not due to any imperfection in the films used, but to the fact that only a highly limited range of filters is generally supplied for the smaller cameras. Of course, for the ordinary run of amateur cinematographers this is by no means an unmixed blessing, for in apparatus for the novice the chief requirements are simplicity and foolproofness. So the simplest of cameras and the 2x and 4x filters generally available are quite adequate—for the beginner. But for the more advanced worker, this extreme simplicity is often a real drawback, for it bars the use of the wide range of professional color and effect filters.

In common, then, with many another user of 16 mm apparatus, I had felt this need, so when, some time ago, an excellent semi-professional matte box for 16 mm cameras was announced, I looked forward eagerly to owning one. But unfortunately, its makers did not find it convenient to remain in business, so I was robbed of my matte-box. Since then, I have been promising myself that I would find time to evolve my own—but the necessary time has not been forthcoming.

But, one day last month Jackson Rose, A. S. C., walked into the office of the American Cinematographer with the clever little matte-box that he devised for the Leica still camera, and which was described in the July issue of this magazine. There was an excellent start toward a 16 mm. matte box! I secured one from Mr. Rose, and with surprisingly little difficulty, managed to adapt it to 16 mm. service. As Mr. Rose's device is generally available now, many another 16 mm. user may find it suited to his needs, so I will describe the means by which it was adapted.

A 16 mm. Matte Box



In so far as 16 mm. use is concerned, the chief requirements of a matte box are that it be capable of holding the standard professional filters, and gauze mattes; that it be mounted so that it can be adjusted along the axis of the lens, and that it furnish additional sunshade protection to both lens and filters. Two of these features Mr. Rose's device embodies, the third can easily be added to it.

The matte-boxes in professional cameras are generally mounted on a pair of rods extending horizontally in front of the camera, and firmly affixed to the tripod. The matte box is mounted above these arms on a bracket which permits it to slide along them. In a 16 mm. installation, these supporting arms are best mounted in a block mounted between the tripod-head and the camera. My own device used a Filmo focusing alignment gauge, beneath which a solid brass block is fixed, with threaded holes for the matte box arms and tripod screw. The two matte box arms are made of ⅜" aluminum tubing of sufficient length to accommodate the device to the longest-focus lens used. In my own case, these arms are unusually long, due to my penchant for extreme telephoto lenses—12", which is, oddly enough, two inches longer than the comparable units in the professional matte box made by Fred Hoefner, who made mine. Upon this slides the bracket which supports the actual matte box: this bracket locks in place with a set-screw. From this bracket extends the support of the matte box, in this instance, two 5/16" brass tubes. Into these tubes fit two small split-pins, which are in turn fitted to the lower part of the matte box. This unit can be used with any lens of less than 1½" in diameter, and forms an effective means of using the standard 2" square professional color, neutral density, and effect filters, and, if the camera is fitted with some means of focusing the full frame on a ground-glass screen, gauze mattes, as well. The cost of the complete unit was approximately $50, of which the majority is represented by labor in making up the mounting. Such a device is by no means recommended to those whose cinematic efforts are confined to the snapshot type of work, but to those whose work is more advanced than this, it can be of real value.

Movies From Stills

In every vacation's filming, most of us come across scenes of some sort—usually of a scenic nature—which we need to complete our picture, but which we have been unable to photograph ourselves. When commercial film of these scenes is available, it is simple enough to buy such films, and cut whatever we may need into our own films. But often there are only stills available of such scenes, and, despite our need, we often hesitate to slow up the movement of our picture by inserting filmed reproductions of these lifeless stills. But—is it really necessary to copy the full area of these stills when we make our inserts? At least one amateur worker of my acquaintance does not think so. Instead, he uses only a small part of the still, and, if he wishes to show more than that bit, pans or tilts his camera around the still just as he would have panned or tilted on the actual scene. The result on the screen is surprising, for it keeps his inserts moving almost as successfully as though the actual scene itself had been photographed directly with the movie camera. Another advantage of this method is that it makes possible to the amateur the technique of "zoom" shots, in which the camera swoops up to or away from the object of principal interest. This is difficult—almost impossible—to do in straight 16 mm. camera work. Of course the stills used must be chosen carefully, as any prominent figures, or objects which would naturally be moving, will spoil the illusion. But the method is a great trouble, time, and expense saver. Try it!

Scripts

Among other things, the summer months seem to be a sort of open season on 16 mm. photoplays. And perhaps the greatest stumbling-block of most of these amateur production-units seems to be the question of stories. Suitable stories are not

(Continued on Page 43)

Professional Amateurs

Ann Harding is the Cameraman of Her Family

by **WILLIAM STULL, A. S. C.**

Photos by William Thomas

PLEASE, mister, is this a moving picture studio?'

'Yes, ma'am"

'Do they make moving pictures here?"

'Yes"

"Can I come in"

This is hardly the sort of conversation that one would expect to hear at the door of a sound stage on a studio 'lot,' where a large corps of receptionists, gate-men, and special police dedicate their lives to the thankless task of shielding film workers from just such interruptions, so I turned to look for the source of these queries I had been visiting Hal Mohr, A. S. C., on the set at the Pathe Studio, where he is photographing Ann Harding in "A Little Flat in the Temple" As I turned toward the door, I saw a slim, golden-headed young woman in a simple sports dress, with a Filmo camera tucked under her arm, entering Now, amateur cameras are another thing which is forbidden within the precincts of a studio—so I wondered still more Then I saw the visitor's face—and wondered no more, for she was Ann Harding, taking a day off from her work—but none the less dropping in for a call on the less fortunate members of the company In she came, with a smile and a pleasant word for everyone, on across the set to ask Director Milton when she would next be needed Then over to Hal Mohr, where the Filmo came into evidence, as she asked his help on some photographic problem

Then she was gone

A few days later, I returned to the studio, and, finding her on the set, asked her to tell me something about her interest in amateur cinematography

"But there really isn't much to tell you," she replied "You see, I'm just a very new beginner at it A lot of my friends are really very good cinematographers, but every roll that I get back from the laboratory is evidence to me of how much I still have to learn about it I don't do any unusual or clever things with my Filmo, the way Mary Astor and Wallie Beery and Leslie Howard do—but I do manage to have a lot of fun with it, just the same.

"It's rather funny, the way I got started with it, though I gave the camera to my husband for Christmas several years ago—but I'm always the one who uses it That same year Harry gave me a car—and immediately appropriated it the same way (he's still driving it!)—so perhaps we're quits, at that

"We've used the Filmo principally for making record-films of our baby; to us, of course, she is the most interesting subject we could possibly choose And it's been all sorts of fun making the pictures of her! She's getting to the age now, however, where direction is becoming a real problem When she was smaller, she never noticed the camera, and we could get all sorts of little, characteristic scenes of her, but now she notices everything, and as soon as she hears the purr the camera makes when running, she immediately drops everything,

(Continued on Page 391

Miss Harding and Director Robert Milton receive some technical advice on cameras from Hal Mohr, A.S.C.

Left to right, starting at top 1, Beautiful wooden architecture everywhere. 2, Quimper. 3, A side street at Quimper. 4, My Quimper teapot. 5 Quimper Cathedral. 6, A rich farmer's wife. 7, Crowd at Pont L'Abbe. A little Bigouden

Babbling About Brittany

by **LAWRENCE GRANT**

This is the fifth article of an unusually interesting series which Mr Grant has written for this magazine The next will appear in the September issue —Editor's Note

DOUARNENEZ, the place from whence, if you are fastidious, if you eat those of the very best sort, your sardines in oil will have come, is on the extreme west coast, and these delectable morsels are caught in the lovely Baie de Douarnenez.

The nearest rival to this fishing town is Concarneau, but I do not think they can boast of anything like the yearly catch that is brought in here

What the records are now I do not know, as all these notes I am looking over were made more than fifteen years ago Then there were about eight hundred fishing boats, taking about four thousand men to man them, and bringing in a hundred million fish a year.

Some of the larger ones are sent off to Paris to be eaten as fresh sardines, a small quantity consumed locally and the rest canned in olive oil by an army of girls and women.

The real flavor of a sardine depends not only on the fish, for all sardines out of the sea on this west and southern coast of Brittany taste the same, the small ones being a little more delicate than the larger ones, but on the handling in the factory, and more than anything else on the quality of the olive oil used Therefore, if you have a palate, buy the most expensive brand, for sardines packed in poor olive oil, or olive oil adulterated with some other kind are no good, and Norwegian and Portuguese sardines, while they are pleasant enough, ought to have another name altogether, so different are they from that lovely shining, pink two-mouthful-morsel the real French "sardine a l'huile"

And then, fresh from the sea and grilled in butter! That is something that you must go to Douarnenez to discover I have never had anything like it, not even brook trout or Dover sole, be they ever so marvelously cooked.

Fish is so plentiful in these parts that in the contract drawn in engaging domestic help there was a clause stipulating that fish should not be the dinner dish in excess of twice a week

It is a lovely sight when standing at the end of the jetty in the afternoon to watch these boats pass in groups of twos and threes. Leaving the calm of the harbor under the impetus of a gentle breeze from the land, then keeling over in seeming surprise as the stronger wind strikes them immediately they are a few yards outside the shelter of the lighthouse breakwater, and riding out into the Bay of Douarnenez spreading out like an enormous fan till they become little dots on the horizon

There they will stay, till you have spent your night in bed, and by the time you are about again at the quay side in the morning, you will find them all riding at anchor, and thousands upon thousands of fish coming ashore in baskets

Eight hundred mastheads each carrying a magic veil of fairy blue. These are the nets hung out to dry

For the sardine is shy and crafty Therefore the nets must be this lovely blue color, so that it may be almost invisible when lowered into the sea.

Then it must be very fine and very strong, fine for the best fish are small, strong, for the catch is heavy And these qualities make a net a costly thing, and mending them a necessary and delicate art

As you pass down the streets you will find two high poles erected in the yards of the houses Stretched between them bright blue nets, looking like giant fairy cobwebs, while behind them young girls in the picturesque local costume, looking like multicolored flies, throwing their shuttles back and forth with bewildering rapidity and skill

It is a great unhappiness to me that I broke all my Douarnenez pictures, and sold my motion picture film, so of this place I have no personal record, and this is curious because it is almost my favorite spot in Brittany, in spite of the continual smell of fish, and the early morning clatter, clatter, clatter of the clogs as the sardine girls march off to the factory

At the hotel here I used to wait for lunch each day for my grilled sardines, for they were a gastronomic novelty to me, and I did not want to invoke the contract restricting their frequency

By the time you have traveled about this far in France you will discover that if you get more than one knife and fork to go through dinner (and of course in France there are always several courses,) then you are in an hotel of the "premiere classe," but if only one knife which must be wiped off on your napkin between each course, then you have landed yourself in a place of the "seconde classe" and as I mentioned in a previous chapter, if you are staying over night there the napkin may be laid away in a pigeonhole for the next meal or next day!

In many station restaurants they are very practical, for on entering you will see long tables already set for the arrivals, or for local diners, and standing high above the tables in clear view, cards saying:—"1 franc 50"—"2 francs"—"2 francs 50"—meaning that if you sit at one of these tables you thereby indicate without waste of time or words that you desire the table d'hote dinner at the price displayed on the card Therefore everything is brought to you without orders or delay.

No waste of waiter's time or your breath, you sit down and eat what he brings, including naturally, "vin ordinaire," of which a bottle is put at each "cover" place

Now here again is where the French combine their business sense with "psychologie," for we all are snobs at heart, or we want to look like good sports, and certainly not be regarded for the rest of the trip as pikers, so the result is that many a man with a fifty cent pocket book will sit at the dollar table Especially if his wife is traveling with him, or he has found a kindred feminine soul en route!

Food varies quite widely, for there is bad food in France, and as to coffee! ONLY in America can you consistently get good coffee, in France it is too awful, in England I must look for a word in the dictionary to describe it, though it is not so awful as in France, and they do make splendid tea, to balance things, but in France the coffee is appalling and the tea is worse That is why they drink wine!

Generally the food quality varies in the inverse ratio to its cost. In Morlaix where it was dear, though I will not specify the hotel where I stayed, but it happened to be one with several courses and one knife and fork, it was very poor In Paimpol where it was really expensive it was very bad indeed, and I do regret this because the hostess and sister were quite the reverse, and I really mean, **quite** the reverse, while at the Ile de Brehat and Lannion where it was cheap, it was perfection

You find more curious people and characters in the smaller hotels of France than any places I know, odd people, and what we call "Dickens" characters

I came upon one man at several places, with a pretty daughter, and it did not matter to him how many or how few "table tools" they supplied, for he used his own

He would use the hotel spoons and forks, but never their knives. He would dive into his trouser pocket and take out a clasp knife, he would open the smallest blade, which from the look of it had a razor sharp edge on it, and with this he would carve everything, carefully cleaning the blade on his napkin between each course, and then stropping it on the palm of his hand. He had odd table ways of eating, too. He was furtive and suspicious about it, he would get a sufficient pile on the fork, lean very close over the plate, bring the load fairly near his lips, and then with a sort of vacuum cleanser indrawn breath whisk the more than mouthful in, then he would raise his head slightly and look quickly round as though to say, "Well, I got that in before any of you could stop me."

The only course for which he did not use the pocket knife was the soup. This he shot into his mouth from the pointed end of the spoon, with many sounds of deep appreciation, and when the spoon failed to get the last few drops, he lifted up his plate and poured the remainder down his throat.

With the gravy on his plate he was also un-wasteful for he chased it round with a bit of absorbent bread, 'dunking" I think it is called by some over here, and left the plate polished.

He had an odd way with the fish, for when the waiter went round with the dish on which was one nice little fish for each diner at the table, he took his famous knife, and cut two fish in halves, and took the head end of each leaving two tails for someone else. Yet I found after that this was not mere desire for the thicker and better end of them, it was the **heads** he was really after, for after he had finished all that you or I would eat, he sucked these dry with great approval.

To add to his peculiarities he had a mild St. Vitus dance, which caused him to appear to nod his head after each mouthful had reached its destination as though to express his satisfaction.

He never raised his head except between courses and then just enough to shake down the last and make room for the next, and then his eyes would pop out as though in mild surprise at his own shocking behaviour.

With the "petits pois" he was a conjurer. He would poise a pile on the convex side of the fork, he would hold this about two inches from his mouth, and as it were with one movement he would blow out his breath to cool the peas, then draw in his breath, and a stream of them would be suctioned up into his mouth.

He ate **all** the chicken course, white meat, dark meat, and followed these with the bones, all of them! (Ripley—Believe it or not.)

And all the time he had a curious jaw movement, a little like toothless old men, down-out-up, down-out-up. One-two-three-one-two-three—waltz time, and all he needed was an orchestra playing the "Blue Danube."

Yet otherwise he was quite a normal person, very pleasant and I think I mentioned before that I met him at several places where he and his daughter, his very pretty daughter, appeared to have chosen the same time for visiting. Looking at her fair face I soon got to ignore his funny ways.

One of Brittany's interesting historical legends attaches itself to Douarnenez, for there was once a king there named Marc'h who loved a lady called Yseult, but Marc'h had the ears of a horse instead of normal ones. He managed to keep his secret by hiding his ears under caps, and having all barbers who had to be called in to cut his beard or hair killed immediately after they had attended to his beauty culture. Unfortunately he allowed his better feelings to make him merciful in one case, and he spared the life of one barber after swearing him to secrecy. The barber did not tell anyone, but the secret so preyed upon him, that he went down to the shore and told it to the river where it joins the sea. Some young reeds were just pushing their way up, and caught the words. Later a poet musician cut the full grown reeds and made a musical instrument, but the only sound he could produce from them was the song they had heard in infancy, "Marc'h le Roi de Plomarc'h a des oreilles de cheval" so naturally the poor king lost his girl, and she went off with Knight Trystan de Leonais who lived on the Ile de Trystan, close by. This shows the folly of letting people out "on parole." Dead men tell no tales.

Locronan, about ten kilometers from Douarnenez inland is really a place of importance as far as tourists are concerned, for here is an important 'Pardon" and much that is picturesque.

The Saint commemorated is St. Ronan, and the day to be there is the second Sunday in July. But if you are lucky enough to be there at one of the celebrations which occur once every six years then there will be "doings" for a week that will be remembered always. This sixth year celebration is called "La Grande-Tromenie."

St. Ronan died in a forest somewhere near the conjunction of three Bishop's dioceses, and in order to decide to which Diocese the body should belong the Bishops of Vannes, Cornouailles, and de Leon rode in a chariot drawn by two wild bulls. The bulls encircled the mountain side and came to a stop at the exact place where St. Ronan died. At least the Bishops so decided, and there the tomb was erected. This was at Locronan. Every sixth year the route of the original pilgrimage is followed by a huge procession and a cart drawn by two bulls. Short services being held en route and singing all the way. During this time something like forty thousand persons will visit his tomb.

The costumes here are again very gay in coloring and extremely picturesque. I bought the one worn by the young girl in the picture. It is now in my possession, and after being made about a hundred and fifty years ago is still in very fair condition and the silver braid with which it is covered just as bright as when new.

Several generations have used it as a marriage gown, and it has decked the form of all its successive owners at many fetes and "Pardons."

Much of the heavy and delicate embroidery on these gowns is done by the girl's sailor sweethearts! Capacity to deftly wield an embroidery needle is not there regarded as abnormal in a man. Imagine trying to get away with such a favorite indoor sport in this country!

The modern equivalent of this costume is shown in the group of three young married women, but while it is effective it is but a pale shadow of the older dresses.

Quimper is a name probably far more familiar to people the world over than almost any name in Brittany because some enterprising person has put its chief product on the world market, and in America during the last few years a great quantity has been on sale.

This is the Quimper china ware, teapots, cups, saucers, plates, and many smaller things being in most of the art shops of America, and to be bought at fairly reasonable prices.

The decorations generally include a Breton in "Bragou-bras" and some of the shapes are quaint and ingenious. The tea-pot I brought back with me is effective even though not so practical when you try to wash the leaves out.

This is the city of bridges, and is said to be the most "breton" of all Bretagne, and in old times was looked upon as a sort of "joke-town" as one in New York jokes one who lives in, or goes to Brooklyn. La Fontaine, the poet, wrote of this—

(Continued on Page 41)

Left to right, starting at top 1, It's not war, It's Heaven! 2, Part of procession at Locronan 3, Passing under the relic of St. Ronan. 4, Crowd at Locronan, velvet jackets and all 5, Dou rnenez 6 A Locronan bride 7, Young married women. 8, Girl in old-fashioned cap.

PATH OF RAYS THROUGH MICROSCOPE AND CAMERA

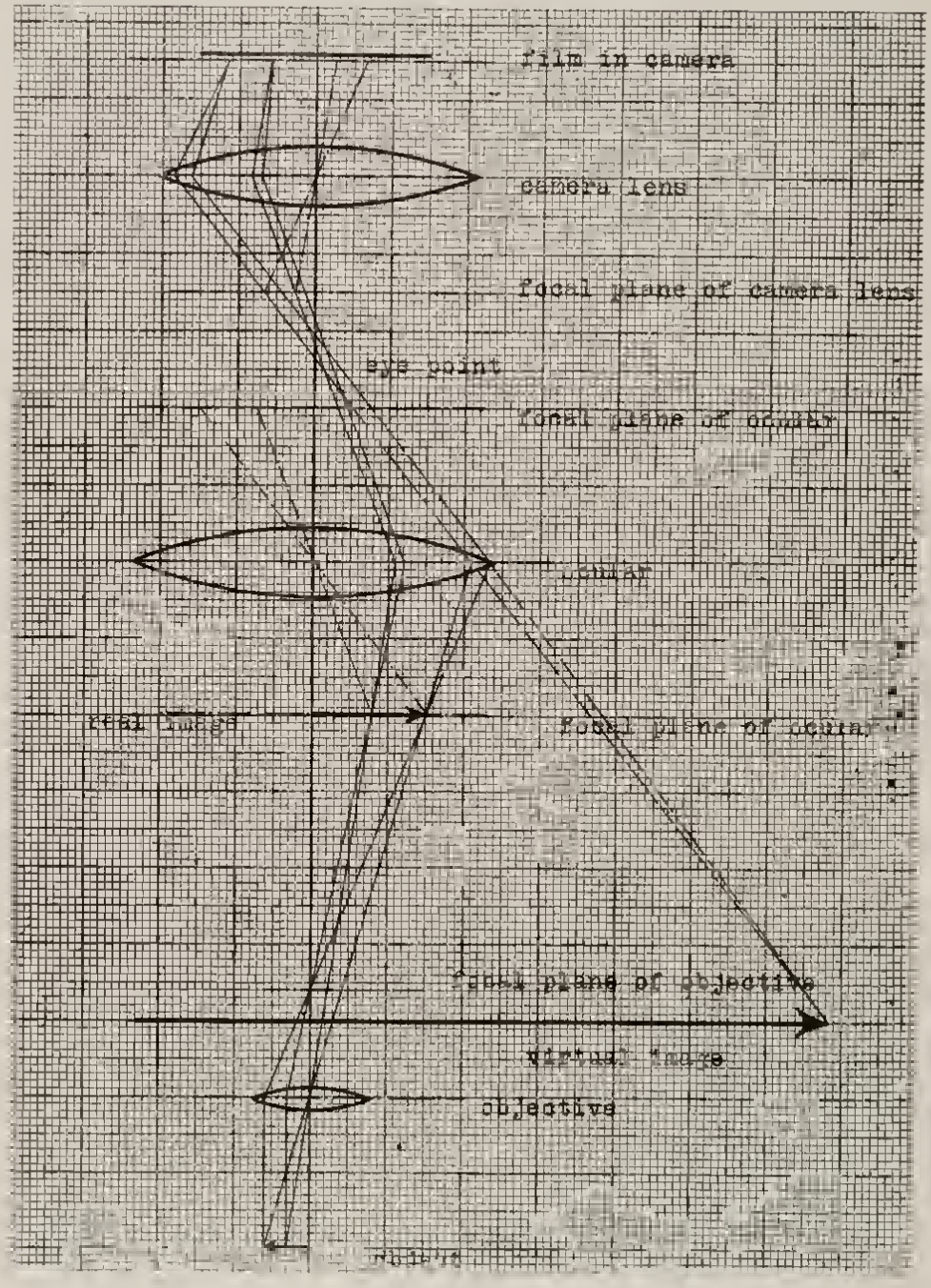


Fig. 6

Cinemicrography with the 16 mm. Camera

by **JOHN C. FARDON**
Basic Science Research Laboratory University of Cincinnati

THE MOTION picture camera has long been an essential instrument in the scientific laboratory for the recording of experiments and the analyses of objects in motion. Before the advent of the 16 mm. camera it was not always within the reach of the smaller laboratories and individual research workers to obtain the standard camera with its costly film maintenance. Furthermore a camera of the 35 mm. type had its disadvantages insofar as it was rather difficult to manipulate under the conditions of certain experiments on

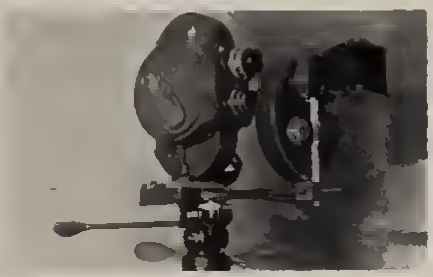


Fig. 1

account of its size. The modern 16 mm. camera is ideal in the respect that it is light in weight, compact, flexible, and within reach of most investigators. In this laboratory the Bell and Howell 70-D camera is being used to good advantage in recording and following feeding experiments on animals, making records of instrument set-ups, and the photography of microscopic objects. Fig. 1 shows the 70-D mounted with the Badgley automatic dissolve and the effect-box. The adjustable mounting and effect-box were constructed in the laboratory. By double exposure and with the aid of the effect-box, with the proper masks, it becomes but a simple matter to record a series of experiments such as the comparison of a set of animals subjected to abnormal conditions to a set of controls. The applicability of the camera is obviously numerous and too well known to give further mention here.

It is the purpose of this article to describe some minor modifications and developments made in cinemicrography in conjunction

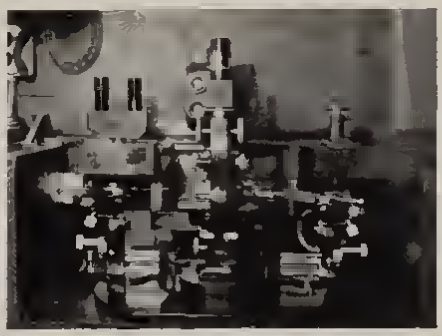


Fig. 2

with investigations on the adaptation of protozoa to abnormal environments.

Fig. 2 shows the general set-up of microscope micromanipulator, and camera. A special body tube has been constructed

(Continued on Page 40)

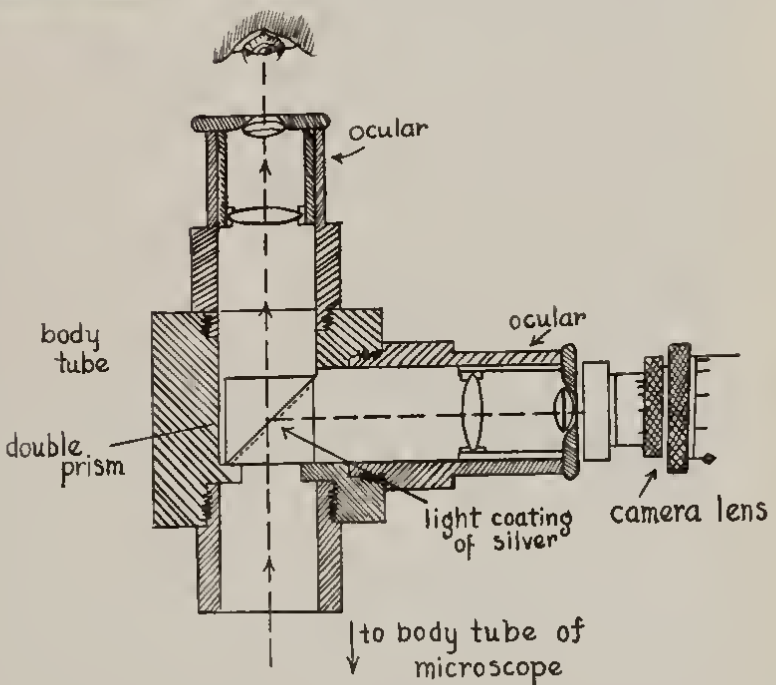
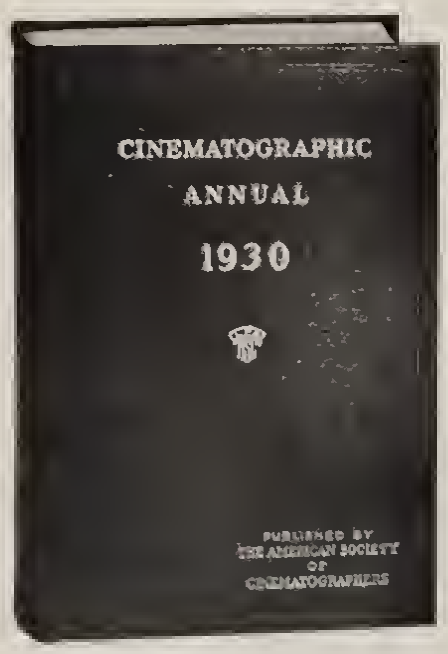


Fig. 3

The Last Word

for Professionals or Amateurs..*the*

CINEMATOGRAPHIC ANNUAL



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(Continued from Page 31)

and makes a dash for it She never stops being curious about the camera, and wanting to know all about it I really don't know just what to do about it, for we really want pictures of her now, and yet—how can we get them? Hal Mohr suggested that we try a longer-focus lens the other day, I think we'll try it, for if we could get the camera farther away from her, it is so quiet that maybe she wouldn't hear it.

"There's no doubt about who the baby's favorite movie-actress is, though—it's herself! Any other pictures bore her stiff, but as soon as she sees herself come onto the screen she excitedly tells us 'There's Jane-ee!' and is perfectly happy

"Outside of these films—which are just like those that every family makes—we haven't done anything very startling, I'm afraid We made a complete record of the progress of our new home, from the time it was simply a vacant lot that didn't even belong to us, up to the time that the house was finished, and we moved in Then another time, when Mary Astor and I were working in 'Holiday,' we made a special 16mm silent version of the film for ourselves We both brought our Filmos to the studio, and we would set one or the other of them up by the big camera, and then we'd get the scene at the last rehearsal—just before the real "take" of the scene No chance for even a Filmo when they're recording, you know! It worked out very nicely, for when Mary was in a scene I would run the camera, and when I was in the scene, she would run it, and if both of us were working, there would always be some member of the company who would be glad to press the button for us I've been intending to try the same thing on some of my other pictures, but since then I've been so busy that I've had no chance to do so I did bring my Filmo to the studio the other day, though, and I'm afraid that I've started the director, Richard Milton, on the downward path, for he was so interested in the little camera that I had a hard time getting it home again!

"Since my husband and I bought our airplane, we've been planning to try and see what we could get with the Filmo from the air. Our machine is a closed one, you know, and it should be ideal for photography But thus far, we've both been so busy that we've not been able to try it. Perhaps it's just as well, for I know I ought to learn a lot more about color-filters and such things before I do any aerial photography I want to try some Kodacolor from the air, too, for half the beauty of flying comes from the different color-effects that we see up there

"But when we do try these things, I'll have to be on the job more fully than I was when we flew East to get our plane, for I had carefully packed my camera, and made plans to bring home some wonderful scenes of our trip, and the new plane, and all that—and when I came to take my first scene, I discovered that I had very carefully left all my film at home! All through the trip back we saw things that we wanted to photograph, and at every stop we also quite forgot about getting ourselves some film; so all that I had for my pains was the privilege of flying my Filmo across the continent—and then flying it back again! My standing as the photographic expert of the Bannister family took quite a drop then—and it hasn't completely recovered yet

"Another thing that has given me a lot of pleasure is experimenting with self-portraiture with my Filmo I set the camera up on the tripod, and try to plan my picture so that when I am in place I will have an attractive composition Then I start the camera running, and step around into the picture It isn't so easy, for you can't, of course, be absolutely sure that you are in the right position There's a great difference between arranging a picture with people that you can see through the finder and arranging a composition by imagination! When I first tried it, the results were really pitiful, my ideas of composition were none too brilliant, and I myself was as awkward and camera-conscious as any schoolgirl And yet, I've never been the least bit camera-conscious in any of my work at the studio I suppose it's because I know that, in the studio, the photography is always in the hands of some supremely competent man like Hal Mohr, while at home, when I'm doing the photography, I know it's in the hands of a supremely incompetent novice! Still, thanks to the help that all the cameramen have gladly given me, I'm becoming less of a novice You know, when I first entered pictures, I was rather afraid of the cameramen, for I had heard that they were a terribly clannish upstage lot, bristling with professional secrets and haughtily disdainful of newcomers and amateur photographers What a relief it was when I found out what charming, friendly people they really were! All of the men that I have worked with—Hal Mohr, John Seitz, Norbert Brodin, and many others, including their second cinematographers and assistants—have been more than willing to help me, both in my professional work and in my amateur work with the Filmo Many of them, I find, use 16mm cameras themselves, and, whether they do or not, they have been more than willing to help me with my little problems They've often gone quite out of their way to explain things to me, and to show me how to make my films better I've a lot to learn yet, but with their help I don't see how I can help learning But please don't say that I'm a good photographer, for I'm not—yet"

Miss Harding and her Filmo. The gentleman is Director Robert Milton

Perhaps Miss Harding isn't a good photographer—but, I have never yet met a real novice who would admit the fact, nor an expert who claimed to be one.

●

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Cinemicrography

(Continued from Page 37)

to fit the tube of Bausch and Lomb CBE miscroscope As shown in fig 3, the usual method is used to split the light in two directions with a double prism One of the 45° prisms was coated with a thin film of silver and then cemented to the other with Canada balsam As shown in the figure the prism is so mounted that the greater percentage of light received from the objective is reflected to the ocular facing the camera lens, the lesser amount to the eye It has been found that very good exposure and definition can be obtained by leaving the lens in the camera since the rays of light upon emerging from the ocular are so nearly parallel that when the camera lens is set for infinity the object being observed with the eyes is also focused sharply on the film emulsion Fig 6 shows a diagram of the path of the light rays through the miscroscope and camera lens All pictures made thus far have been with the F-1 8 and F1 5 one-inch lenses, the lens hood of the camera nearly touching the ocular of the microscope.

An ordinary automobile 50 c. p lamp is used as a source of illumination with a condenser for collecting the light. Sufficient illumination can be obtained by this method when

Fig 4

using oil immersion and a magnification of 1800 x, the camera speed at 16 frames per second

On some deeply stained slides it is necessary to bring the voltage a little over that at which the lamp is rated But then with inanimate objects the camera can be operated at half speed

For the determination of the correct exposure a thermopile is used (obviously the photoelectric cell or selenium cell will answer the same purpose) Fig 4 shows the thermopile (in this case the Adam Hilger 10 junction thermopile used in their infra-red spectrometer) in its light-tight housing When having the object on the slide properly centered under the objective, the ocular opposite the camera lens is removed and the thermopile inserted in its place Readings are then taken with the galvanometer (which should have a sensitivity of about 1x10-7 amperes) and the illumination so adjusted until the desired setting is obtained It is naturally necessary to first calibrate the light sensitive cell by trial exposures and making a record of the galvanometer reading

Fig 5

In fig. 5 may be seen three microphotographs taken by the methods described above Referring to the figure, a, is a shot from unstained encysted protozoa; b, a stained section of a portion of the grasshopper testis showing the deeply stained chromosomes, and c, living protozoa A magnification of 860 x being used on all three preparations

Babbling About Brittany

(Continued from Page 34)

"C'etait a la campagne,
Pres d'un certain canton do Basse-Bretagne,
Appele Quimper-Corentin
On sait assez que le Destin
Addresse la les gens quand il veut qu'on enrage
'Dieu vous preserve du voyage' "

Through the center of the city runs the river Odet On the one side shops and a good street, then the river, and on the other bank lovely gardens and houses, and as there is no street on that side, every house has to have a private bridge across the river to the front gate, so there is a bridge every hundred feet or so Very delightful

The streets are old fashioned and full of wooden beamed houses, and the cathedral towers over all with its twin spires making it very impressive

It was in the cathedral here that I saw for the first and probably the last time a priest conducting some simple evening service in the cathedral in a side chapel, and from under his cassock peeped the high black boots and spurs of a French army officer.

In my picture of the street and cathedral there is one spire showing, but another just like it is lurking behind the tall shop buildings on the right It was a case of miss the lovely old house on the left middle foreground and catch both spires, or get the house and miss one spire So I chose the house, because after all the other spire is just like the one you see!

The river in addition to running through the city at good breadth has several little tributaries which come burbling through at right angles to it, and run in between the houses on their way making a miniature Venice of some side streets

When you are here you must make a trip to the strangest people in Brittany, whose origin is entirely unknown, and whose facial characteristics are different to all other Bretons

The people of Pont l'Abbe Wide face, high cheek bones, almond slanting eyes, and dresses massed with strange orange colored embroidery Keeping to themselves, marrying within their own people Where they came from and when, has, as far as I can find out, never been definitely settled They are certainly not Celts as the rest are They almost certainly are some sort of Oriental They are called "Bigoudens" which word describes the peculiar little cap and strange coiffure of the women The hair is dragged up very tight at the back and stuck under the curious little conical cap Their hips are padded out tremendously, and a skirt of many pleatings goes over this and sweeps voluminously round them On Pardon days you get a good view of the back of these dresses in the overflow of worshippers crowding round the main door of the Church.

I almost forgot to say why the old woman at Locronan was laughing so Her husband had just gone to war, and she had been advised that she would receive a weekly allowance from the Government during his absence She was astonished and delighted "What," cried she to the official who made the first payment, "fifteen francs a week, and no husband, it isn't war, it's heaven"

(I am not sure of the exact amount paid by the Government to soldiers' wives, so used 'fifteen francs" as an arbitrary amount.)

●

Ira Morgan

IRA H MORGAN, better known as "Joe," has been engaged by Walter Futter to photograph a number of subjects for "Curiosities" Morgan will be remembered for his remarkable photography of "When Knighthood Was in Flower" and "Never the Twain Shall Meet"

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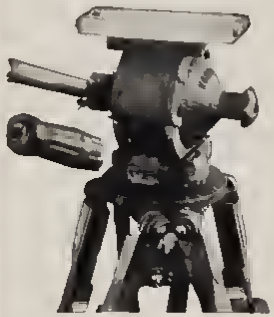

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New Eastman Projector

THE KODASCOPE, Model K a projector announced as giving a quality of projection surpassing anything previously seen in the 16mm field and with a cooling system so efficient that even after hours of running the lamp house is barely warm to the touch, makes its appearance before the home movie public this month

The new projector appears as a companion machine, in compactness and efficiency, to the Cine-Kodak, Model K, the newest Eastman motion picture camera. Simplicity of operation is likewise an outstanding element in the new Kodascope, with operating controls grouped on a panel and with most of the important bearings oiled from a central point

The secret of the screen brilliance produced by the Kodascope, Model K, is said to lie in a new and improved optical system The illumination, provided by a special 260-watt lamp, is direct, rather than by reflection, and the available light is further conserved by light-trapping of the lamp house in a way permitting but a minimum of stray light to leak into the room during projection The latter feature adds to the darkness of the room—a condition especially valuable in Kodacolor projection—as well as adding to the amount of light reaching the screen

An attachment for plugging-in a floor lamp or a table lamp to the projector so that the room light goes on when the projector is turned off is an innovation of the "K" Kodascope, an innovation designed to eliminate fumbling around in the dark at the end of a reel and to assure that the room becomes dark promptly when the picture starts The ammeter which is standard equipment on the new projector is indirectly illuminated, like the instrument board of a fine automobile

The motor rewinds the film at high speed Another unique feature is a rewind release and brake that assures solid winding of the film on the reel.

Kodascope "K" is supplied with a two-inch lens for maximum black and white brilliancy Lenses of various focal lengths for both Kodacolor and black and white pictures are available as extra equipment They are instantly interchangeable with the regular lens

The lamp can be replaced, and the optical parts can be cleaned, very simply by opening a hinged door to the lamp house. The design of the reel arms prevents the driving belts from leaving the pulleys when the arms are folded down The latter feature contributes to the freedom from adjustment with which the projector can be put into use

Filmo Topics

THE August issue of "Filmo Topics, the interesting monthly magazine published by the Bell & Howell Company, holds much of interest for the amateur cinematographer A copy will be mailed free if you write to the Bell & Howell Company, 1848 Larchmont Ave, Chicago, Ill The table of contents for August follows

"Using the New Film"—Article by R Fawn Mitchell on the new supersensitive panchromatic film

"A Trip to Europe Every Week"—How three clergymen recorded their 20,000 mile journey in films that paid for themselves

Contributors Page—What amateur cinematographers are doing along the line of the unusual, and how they're doing it.

Gas Welding Filmed in Kodacolor—a unique and fascinating subject is filmed in color

Questions and Answers

Four Musketeers

(Continued from Page 21)

of the tropical sunlight usually demanded a considerable decrease in exposure, the dark greens of the jungle backgrounds, on the other hand, demanded a sharp increase in exposure But, for the most part, their questions were surprisingly intelligent, and I was at times hard pressed to answer them properly

After India, our trip was almost over; a long but delightful voyage up the Red Sea and across the Mediterranean to Italy, and we were back on the beaten track again Then separation of our merry quartette, a few days of Paris, and home again, for me But, after all the wonders I had seen, probably the greatest was the view of that little island of Manhattan as we sailed up the bay, for nowhere else is there such a thrilling sight as the terrific towers of New York

Back in Hollywood and the familiar routine of the studios again, four wonderful months from the day I left Homecoming is always the best part of such a trip—homecoming, and the memories one has stored up I am glad that I've been able to make it possible for us to live the trip over again on the screen, I'd like, too, to be able to live it over again in actuality But I'd hesitate a long time before taking such a trip again, for never again could I hope to find such wonderful travelling companions as Doug and his three merry musketeers

●

Amateur Movie Making

(Continued from Page 30)

hard to find, but the amateur producer must be content to walk before he runs he cannot expect to produce bigger and better pictures before he and his group have learned to produce smaller and simpler ones Therefore, the first efforts of any group should be to produce some absurdly simple thing **well.** The rest will come with experience There are scores of suitably simple stories already put in continuity form in the several home-scenario books available But if you don't care to use one of these, it is really quite simple to write your own continuity The first step is to select a plot Then build your story around the plot, sketching in the action and the characterization Then from this framework, evolve your basic long-shots. Imagine that you can only use long-shots, and tell your story in them In these basic scenes, carefully detail all the "business" that each character must do Then consider this "business," and decide which bits of the action require further explanation explain these in closer shots—medium shots or close-ups as the case may be—and, presto! there you have your continuity, quite painlessly

●

Spiral Control Saves Light

EMBRACING new features which have completely overcome the "shadow and smudge" tendencies to be found in the ordinary product, Lakin Corporation has introduced to the industry a new spiral sleeve ring control which according to its evergrowing popularity seems destined to be a permanent appliance on modern incandescent lighting equipment, at least in a number of our best known studios

The Laco spill light control, designed by Gustav Dietz, builder of Dietz All Metal Reflectors, and authority on lighting engineering, is of spiral construction and built to give a maximum amount of concentrated light

Tiffany, Tec-Art and R-K-O studios, all of whom are employing the new Laco lighting control in conjunction with Laco Lites are not hesitant in saying that it is a boon to the electrician as well as to the cinematographer

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Government Fosters Use of Movies for Teaching Agriculture

THE DIFFICULTY of obtaining really suitable film in satisfactory volume, which has constituted an obstacle to the more general use of motion pictures in certain phases of educational work, does not prevail in the field of agriculture, according to a report just issued by the Educational Division of the Bell & Howell Company

For many years agricultural machinery manufacturers have been telling their story with movies, and the U S Department of Agriculture has long recognized the teaching power of the film as a dynamic supplement to other means of education, according to the report The Department's Office of Motion Pictures, with a force of 23 permanent employes and a budget in 1930 of $87,729, has developed a service that last year circulated over 10,000 reels of film, supplied on a free loan basis, for an estimated audience of three and one-half million, we are informed

Says the report

"Mention should also be made for another audience, probably equal in size, comprising the teachers and students of schools in this country and abroad which have purchased the Department's films Last year 419 films were sold to schools in this country and 255 abroad From the Argentine to the Union of Soviet Republics U S Department of Agriculture films are serving the needs of farmer and teacher

"Early last year a beginning was made in the preparation of films of the newer 16 mm safety type Twenty such films were made available as a start, with some misgivings as to whether the demand would be large enough to warrant the enlargement of this service A year later one of the men in charge wrote Schools seem very anxious to get 16 mm films, and if our (loan) service were extended to schools we would, doubtless, be swamped with requests for films'

"The budget of the Office of Motion Pictures is so limited that it has hardly been able to take care of the loan demands from its principal field of activity, the county agricultural agents Over a thousand requests had to be left unfilled for lack of films last year. However, 16 mm prints of any Department of Agriculture films may be purchased at the extremely low price of two and one-half cents per foot, or $10 per 400-foot reel Various state university extension divisions have purchased these films and are making them available to schools under their jurisdiction, and the tendency in this direction is growing rapidly

"The advent of sound, according to the director of the Department's extension service, has resulted in a temporary drop in demand for films and a falling off of total attendance An experimental recording laboratory has been set up, and the Department's new educational pictures are being so prepared that an accompaniment of sound may easily be added later It is reported that work is now in progress on three sound-on-disc recordings One sound-on-disc film subject on 'Sage Making' has already been prepared The Director of the extension service states 'The budget and facilities of the office are based on past needs for silent pictures and are wholly inadequate for the installation of sound equipment and the much greater cost of the production of sound pictures' It is expected that funds will be made available both for the production of the most modern type of material, and for its distribution where the greatest demand and need exist—the school field

'The department does not contemplate the free loan distribution of sound-on-disc subjects However, as fast as the subjects now in preparation are finished, 16 mm sound-on-disc versions will be offered for sale at very reasonable prices Subjects now under work include' 'Forest and Wasteland,' 'Forest and Water,' and 'The Indian Sign Language'"

Kino-Plasmat f:1.5 . . . 15mm. focal length

CONSIDERED in its application to the new Supersensitive Film, Hugo Meyer's announcement of a new addition to the Kino Plasmat Family of Lenses, namely the f:1.5 15mm Lens, is particularly interesting. This lens combines unusual speed with wide angle properties. With this combination, that is film and lens, it should be remarkably simple to shoot all sorts of indoor and outdoor scenes, even under very poor light conditions.

In its corrections and optical construction, this lens is a true Kino-Plasmat—corrected for the primary colors of the spectrum and affording a true-to-life rendition of the subject. The corrections of this particular lens afford extremely sharp definition even when wide open.

Its unique combination of extreme speed and wide angle properties will enable the cinematographer to take indoor shots of objects comprising a very wide field of view at extraordinary close range. It should prove ideal for cramped interiors and for extended views. This lens takes in approximately a 60% wider field than the 1-inch lens.

In addition to the Plasmat's characteristically improved depth of focus, the extreme short focus of this 15mm. lens assures sharp definition even when the operator is careless in gauging his distance or setting the focusing scale.

The lens is in a focusing mount calibrated from 1½ ft. to Infinity. Like all Kino Plasmats it is suitable for work under all conditions, indoors or outdoors. In brightest sunlight, it can be used at the smaller stops with complete satisfaction assured. The speed of this lens is sufficiently high to permit the use of a 5X filter.

It is not necessary to remove this lens from the turret when revolving the latter.

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New Firm Enters Sound-On Film Field

COMPRISED of men long established in the motion picture industry, with experience qualifying them to meet the most exacting demands of modern production, General Sound Corporation, Limited, has entered the field offering "the ultimate in sound-on-film recording." With up-to-date laboratory and offices at 5360 Melrose avenue, the new concern plans to offer the best in sound-on-film recording.

Charles Piper, well known laboratory technician and cinematographer, is president of the firm, while Frank P. Arrousez, inventor and patentor of Laco incandescent lighting equipment and one of the industry's best known electrical authorities, is vice president and general manager. Bert Bates with years of association in the enterprise has been made secretary and treasurer.

B. J. Kroger, chief recorder for General Sound Corporation, was at one time affiliated with Photophone and Fox Corporation. He has to his credit the sound recording of many outstanding film productions. The new sound organization recently completed the recording for Pioneer Pictures first feature length Multicolor production, "Yesterday in Santa Fe" and will commence work shortly on a feature Western for Dick Kahn, after which they will record sound for the second Pioneer Pictures production, "Yellow Legs," to be begun early in August. Twenty six screen novelties to be produced by Jess Weil, also are to be recorded by this new concern.

According to Willis Kent of Tec-Art, General Sound Corporation Limited, unquestionably offers excellent independent recording.

31 Victor National Branches In Operation

IT was recently announced that the Wholesale Division of the National Theatre Supply Company had acquired exclusive rights to the wholesale distribution of Victor Cine'-Cameras, Cine'-Projectors and Animatophones for the entire United States.

The work of organizing non-theatrical departments in the 31 Branches of the National Theatre Supply Company to handle the sale and servicing of the Victor 16 mm. line has been practically completed, according to word received from A. M. Beatty, Wholesale Division, National Theatre Supply Company.

Mr. Beatty's entire time for the past three months has been given to the task of establishing these departments and securing the services of a personnel thoroughly qualified to satisfactorily handle all phases of the specialized work connected with 16 mm. sales and service. Personal supervision of all the details connected with the tremendous venture has made it necessary for Mr. Beatty to cover thousands of miles of territory and to visit every State in the Union.

E. L. Schroeder, Sales Manager of the Victor Animatograph Corporation, Davenport, Iowa, is making a series of visits to each of the 31 branches for the purpose of schooling the personnel and coordinating the work between the branch non-theatrical departments and the Victor Factory and Sales Organization.

Retail distributors of Victor products who have been contacted by the new factory service-sales branches are enthusiastic over the possibilities offered by the Victor-National marketing plan. Victor users are naturally pleased at the prospect of having expert service close at hand, should it ever be required.

Photophone Recording Unit Shipped to Gainsborough

R-C-A Photophone is shipping one of its Standard News Reel recording units to the Gainsborough Pictures studios in London and its first assignment will be with the Rex Ingram unit for the recording of exteriors in Africa which are to be included in a super-production now being made under Ingram's direction.

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FOR SALE OR RENT—Mitchell camera equipped for Sound. Al Gilks. HE-1490 or A. S. C. Office GR-4274.

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FOR RENT—Mitchell camera fully equipped for sound. Harry Perry. Phone OX. 1908.

FOR RENT—Eight Ball & Howell cameras, fast lenses, large finders, Mitchell tripods. Park J. Ries, 1540 N. Cahuenga Ave. GR-1185.

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FOR RENT—Mitchell high speed camera with latest 40, 50 and 75 mm. Pan-Astro lenses. 1000 ft. magazines, loose head tripod. Pliny Horne, 1318 N. Stanley. HO-7682 or HO-9431.

FOR RENT—One Mitchell Speed camera fully equipped for sound. 40, 50 and 75 mm. and 4 and 6 inch Pan Astro lens. Norman DeVol, 6507 Drexel Ave. ORagon 7492.

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